

AN ULTRAVIOLET MULTIPLET TABLE

The Spectra of Hydrogen, Helium, Lithium, Beryllium,
Boron, Carbon, Nitrogen, Oxygen, Fluorine, Neon, Sodium,
Magnesium, Aluminum, Silicon, Phosphorus, Sulfur,
Chlorine, Argon, Potassium, Calcium, Scandium, Titanium,
and Vanadium



Circular 488, Section 1

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

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UNITED STATES DEPARTMENT OF COMMERCE, Charles Sawyer, Secretary
NATIONAL BUREAU OF STANDARDS, E. U. Condon, Director

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By CHARLOTTE E. MOORE



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Foreword

In 1945, when the manuscript of the Revised Edition of "A Multiplet Table of Astrophysical Interest" (see footnote 1) was being prepared, a violet limit of wavelength near 3000 Å was imposed because the ozone in our atmosphere absorbs radiation of shorter wavelength. At that time, however, the suggestion was made that an extension of the Table to include multiplets in the far ultraviolet was needed. The astrophysical importance of ultraviolet transitions in the spectra of abundant elements in the interpretation of observed nebular and stellar lines was well known from the work of Bowen and others. A further impetus to such a program was provided with the advent of rockets, since it is now possible to observe the solar spectrum in the region of shorter wavelengths. Recently two films that record the solar spectrum to about 2300 Å were recovered from rocket flights, and attempts are being made to extend the observations farther to the violet.

The earlier astrophysical multiplet table has proved to be inadequate to meet present needs, chiefly because of its limited range of wavelength. In order to make more complete data available to those engaged in rocket research, to those working on spectrochemical analysis, and to scientific investigators in other fields, as well as to the astrophysicist, the present ultraviolet extension to it is being prepared.

This work is being done in conjunction with the program on "Atomic Energy Levels." The present Section includes selected spectra of the first 23 elements of the periodic table, H through V, covering the same elements as Volume I of *Atomic Energy Levels* (see footnote 6). Multiplets of 79 spectra are included, but, as before, no attempt has been made to list all known classified lines of each spectrum.

The arrangement of the present Table follows in detail that of the Revised Multiplet Table. Similarly, upon completion of the tabulation of the multiplets, a Finding List will be prepared containing all lines in order of wavelength.

The author of this Table has had the benefit of the expert advice of W. F. Meggers, Chief of the Spectroscopy Section of the Division of Atomic and Radiation Physics, under whose direction the program is being carried on. She has also received cordial collaboration from a number of institutions in making the selection of lines to be included, particularly from the Mt. Wilson and Yerkes Observatories.

WASHINGTON, D. C., April 1950.

E. U. CONDON, *Director*.

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Beryllium	4	Be I.....	5			P II.....	38
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Boron	5	B I.....	6			P IV.....	39
		B II.....	6	Sulfur	16	S I.....	40
Carbon	6	C I.....	7			S II.....	41
		C II.....	9			S III.....	42
		C III.....	10			S IV.....	43
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		O II.....	18			A III.....	50
		O III.....	19			A IV.....	50
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		F II.....	22	Calcium	20	Ca I.....	54
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		Ne III.....	25	Scandium	21	Sc I.....	56
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		Na II.....	27	Titanium	22	Ti I.....	58
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		Mg III.....	29			Ti IV.....	62
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1. Introduction

The ink was scarcely dry on the Revised Multiplet Table¹ published in 1945, when astrophysicists were compelled to extend their spectroscopic horizon to include the ultraviolet solar spectrum, heretofore masked by the ozone in the earth's atmosphere. The present ultraviolet limit of the solar spectrum films taken from a V-2 rocket is near 2300 Å,² and efforts are being made to extend the observations to regions of shorter waves.

During the work on the R M T, however, requests for ultraviolet multiplets were received. The important rôle of selected ultraviolet lines in producing the nebular lines has been fully discussed by Bowen,³ as, for example, the line of He II at 303.7 Å, those of O III at 303.7 Å and 374.4 Å, and the pair at 374.4 Å due to N III. Swings⁴

has commented that "certain forbidden transitions that are not directly observable may play a rôle in astronomy, as, for example, by fluorescence excitation, ionization or dissociation." The astrophysical importance of ultraviolet lines of abundant elements has more recently been stressed by Merrill⁵ and others, whose work illustrates that "peculiarities" in a number of stellar spectra can be attributed to selected ultraviolet transitions. The full significance of these "peculiarities" and the mechanisms that cause them have doubtless not yet been completely realized. For these reasons, and, also, in order to make more complete data available to those working on spectrochemical analysis, the present Ultraviolet Supplement to the R M T is being prepared.

2. Scope of the Ultraviolet Multiplet Table

It is not the purpose of the writer to record here all multiplets involving lines of wavelength shorter than about 3000 Å, the limit of the R M T. The limitation of the Table to lines of astrophysical interest presents a difficult problem of selection from the vast amount of existing data. From the experience gained in the identification of solar lines in the regions of longer wavelength, she has attempted to include all important lines to be expected in a high-dispersion ultraviolet solar spectrum, in addition to those needed to interpret the existing rocket solar films. She has had, also, the benefit of detailed suggestions from I. S. Bowen, P. W. Merrill, and others at the Mount Wilson Observatory. Bowen has generously furnished a list of the strong lines of spectra of elements abundant in the sun and similar stars. This list was made in connection with his study of fluorescence

phenomena in astronomical spectra. It has been a valuable guide in the selection of both the spectra and lines of the lighter elements (H through Ca) to be included in the Table. A preliminary draft of the Table was submitted to the Mount Wilson and Yerkes Observatories for criticism. As a result of comments received some additional lines have been included.

In compiling an Ultraviolet Multiplet Table it is difficult to satisfy the present and future needs of all users. In view of the probable shortcomings of the present Table for those who desire more extensive lists of lines, it is suggested that workers consult the volumes of Atomic Energy Levels.⁶ From this work one can obtain further literature references and also determine for a given spectrum both the positions and the probable percentage of lines omitted.

¹ Contributions from the Princeton University Observatory No. 20 (1945). (Here referred to as R M T.)

² J. J. Hopfield and H. E. Clearman, Jr., *Phys. Rev.* **73**, 877 (1948). E. Durand, J. J. Oberly, and R. Tousey, *Astroph. J.* **109**, 1 (1949).

³ I. S. Bowen, *Astroph. J.* **81**, 1 (1935); *Rev. Mod. Phys.* **8**, No. 2, 55 (1936).

⁴ P. Swings, Letter (May 1945).

⁵ P. W. Merrill, Mt. Wilson Contr. No. 735; *Astroph. J.* **106**, 274 (1947).

⁶ C. E. Moore, *Circ. Nat. Bur. Std.* 467, Vol. 1 (1949); Vol. II in press.

3. Arrangement of the Table

The form of arrangement is identical with that of the R M T. Under each spectrum the first line contains the ionization potential; the grade of analysis; the grade denoting the relative number of classified lines included as compared with the total number classified in the ultraviolet; and the date of completion of the manuscript. The limit is also included for three spectra, H, He I, and He II.

The ionization potential is copied from the R M T except for Ar V and Sc I, where improved values are entered. As in the R M T, the limit in cm^{-1} has been multiplied by the factor 0.00012345 to obtain the tabulated ionization potential, which is expressed in electron volts. Birge's revised conversion factor 0.00012395,⁷ has been used to calculate the ionization potentials recorded in "Atomic Energy Levels", which introduces a discordance in the two publications. For the reasons stated in some detail on page xvi of the R M T, and in spite of this inconsistency, it has appeared advisable to use the same factor in both multiplet tables.

The analyses of atomic spectra have recently been regraded by W. F. Meggers and the writer in connection with the program on the compilation of atomic energy levels. The revised grades are entered in the Ultraviolet Multiplet Table. As before, the grades range from A to E, grade A indicating that the analysis is essentially complete, and grade E that structure has been recognized, but is limited to a single multiplet or transition.

Similar grades are used in the entry "List A, List B, etc." to denote the relative numbers of classified lines listed here as compared with the total number classified in the ultraviolet, A denoting that all classified lines in the ultraviolet are listed, and D that only a few of the leading ones are tabulated.

The present table includes only a limited number of the spectra of the first 23 elements, H through V, 79 in all. Because the work is still in progress, it has been decided to include with each spectrum the references used, rather than to prepare one large bibliography at the end, as was done in the R M T. These references precede the multiplets of each spectrum. The letters on the left, A, B, C, etc. preceding the reference, indicate the source used for the wavelength quoted in the Table; they are repeated in column 2 under "Ref." For the more complex spectra the letters and corresponding references denoting the source are copied from the R M T, as for example in Ti I. Here, all the references listed previously were not needed and are not repeated. Consequently some letters do not appear, since only those references needed for ultraviolet multiplets are repeated.

The references are followed by letters indicating what was taken from each paper for the present compilation. Three types of letters are introduced for this purpose,

"W L", "I", and "T", denoting, respectively, wavelength, intensity, and terms, the last referring to the analysis of the spectrum. If the intensities from a reference are entered in parentheses in the table, parentheses are used around the "I" following the reference. Those papers used only for analysis or intensity follow the ones used for wavelength, and are not preceded by the letters denoting the source as described above. For example, in Cr II, Edlén's 1934 paper was first choice for wavelength, as denoted by "A" preceding the reference. Every wavelength taken from this paper has "A" entered in column 2 of the Table. Reference "A" was used for intensity and analysis as well as for wavelength, and consequently is followed by the letters "W L", "I", and "T". The last reference was used only for analysis, as denoted by "T" following the reference.

The columns in the Table are identical with those of the R M T, namely, 1, the laboratory wavelength; 2, the reference from which the wavelength was taken; 3, the estimated intensity of the line; 4 and 5, the low- and high-excitation potentials, respectively; 6, the respective J -values of the low and high levels involved in the production of the line; and, finally, 7, the multiplet designation of the line, complete except for the J -values in column 6.

Column 1, wavelength. With few exceptions these are observed laboratory wavelengths, in standard air for lines longer than 2000 Å, and in vacuum for those of shorter wavelength. For H and He II the positions of the lines *calculated* from the series have been adopted. J. E. Mack has kindly furnished these data, using term values that take into account the fine structure separation of the $2s\ ^2S_{1/2}$ and $2p\ ^2P_{1/2}^\circ$ levels as observed by W. E. Lamb, Jr., R. E. Retherford, and M. Skinner.⁸ For further details see, Atomic Energy Levels, Volume I.⁹ In O I Edlén's calculated positions are used for the lines from Reference B. As in the R M T, predicted positions are entered for lines that are masked. In such cases the wavelength is preceded by the letter "m". The letter "P" is entered in the Reference column to denote that the position is predicted, and the masking element is named in column 3.

Column 2, reference (discussed above).

Column 3, intensity. When two different intensity scales are used, or when the weaker members of a multiplet have intensities taken from a reference different from that used for the leading lines, the intensity is given in parentheses. All intensities are eye estimates except those of H and of He II. For these two spectra theoretical intensities calculated by J. C. Brennan under the direction of J. E. Mack and F. T. Adler are entered.¹⁰ These computations were made especially for inclusion here, through the kindness of J. E. Mack and his associates.

⁷ R. T. Birge, Rev. Mod. Phys. 13, No. 4, 237 (1941); Reports on Progress in Physics 8, 131 (1941).

⁸ W. E. Lamb, Jr. and R. E. Retherford, Bul. Am. Phys. Soc. 24, No. 1, 59 (1949) (H); M. Skinner and W. E. Lamb, Jr., Bul. Am. Phys. Soc. 24, No. 1, 59 (1949) (He II).

⁹ C. E. Moore, Circ. Nat. Bur. Std. No. 467, Vol. I, 1 (1949).

¹⁰ Letter (April 1949).

Columns 4 and 5, excitation potentials. As in the R M T, all excitation potentials have been calculated by multiplying the level values involved in the transition producing a given line, by the factor 0.00012345, where the levels start with the ground state *zero*. If the terms of different multiplicities in a given spectrum are not connected by observed intersystem combinations or by good series, parentheses are entered around all excitation potentials in the multiplets involving the terms in question, to indicate that there is an uncertainty in the recorded values.

Columns 6 and 7, J -values and multiplet designations. The last two columns give the complete multiplet designations of the lines, J -values being entered in column 6 for convenience, and the rest of the designation in column 7. The number in parentheses under the designation in

column 7 indicates the multiplet number, as in the R M T. These multiplet numbers will appear with each wavelength in the Finding List, which will form the final Section of the Ultraviolet Multiplet Table.

A detailed description of the types of spectroscopic notation used is given in the R M T and also in the Volume I of "Atomic Energy Levels," and will not be repeated here. Only one special type of notation deserves mention. For spectra of the inert gas type (Ne I, Na II, Mg III, A I, K II, Ca III, Sc IV in the present Section) the pair-coupling notation has been substituted for that used by Paschen and others. The Table on page xvii of the R M T and the column giving Paschen's notation in "Atomic Energy Levels" should suffice for cross reference to the earlier kinds of notation used for Ne I-like spectra.

4. Symbols

The symbols adopted here are identical with those used in the R M T (except for the designation of *raie ultime*) as follows:

* preceding the wavelength denotes that the line is a blend. If no symbol follows the wavelength the line is blended with another in the same spectrum. This symbol is also used in the intensity column when the intensity is blended.

§ follows a wavelength (an asterisk always preceding) to denote that a line in the spectrum of the neutral atom of a given element is blended with one in the first spark spectrum of that element.

§§ is a special symbol following the wavelength (an asterisk always preceding) used for blends not covered by the above symbols, and explained in footnotes.

‡ follows the wavelength of the *raie ultime*. This information has been taken from the papers by Meggers giving the strongest lines of spectra of neutral and singly ionized atoms.¹¹

† follows the multiplet designation to call attention to the fact that not all lines observed in the multiplet are listed here.

m precedes the wavelength when the line is masked, as described above.

5. Acknowledgments

In compiling these data the writer has profited greatly by useful suggestions from physicists and astrophysicists. At the Mount Wilson Observatory, I. S. Bowen and P. W. Merrill have consulted their colleagues and formulated very helpful comments regarding the scope and content of the Table. The manuscript has also been submitted to the director of the Yerkes Observatory, where O. Struve and his staff have kindly examined it in advance of publication. J. E. Mack and his collaborators have carried out extensive calculations of intensity data on H and He II. Their efforts to furnish the results especially for inclusion here are greatly appreciated. Special thanks are due W. F. Meggers and C. C. Kiess for their very helpful and authoritative suggestions and cordial collaboration.

The Director of the Bureau, E. U. Condon, has generously supported this large program.

Much of the material has been compiled by Mrs. Isabel D. Murray, whose competence and care are largely responsible for the accuracy in the details of this work. Similar care has been exercised by J. L. Mathusa and his staff in the Publications Section in the troublesome task of publishing these data. The writer records here her grateful thanks to all whose hearty cooperation has made this extensive project possible. As the work progresses she will welcome suggestions from the users of this Table.

¹¹ W. F. Meggers, J. Opt. Soc. Am. **31**, 44 (1941) (first spectra); **31**, 606 (1941) (singly ionized atoms).

HYDROGEN

H

I P 13.54 Anal A List B April 1949

Limit 109678.758

REFERENCES

A Wavelengths calculated from term values derived by J. E. Mack from the series formula—See *Atomic Energy Levels*, Circ. Nat. Bur. Std. 467, Vol. I, p. 2 (1949). W L, T

J. G. Brennan, unpublished material (April 1949). (Theoretical intensities calculated under the direction of J. E. Mack and F. T. Adler, for inclusion here. "The unit is micromicrowatts per excited atom")

H

H

λ I A	Ref	Int <i>unit</i>	E P <i>Excited State</i>		J <i>values</i>	Multiplet (No.)	I A	Ref	Int	E P		J	Multiplet (No.)
			Low	High						Low	High		
Vac							Vac						
1215.668† 1215.674	A A	2047 1023	0.00 0.00	10.15 10.15	½–1½ ½–½	1s ²S– 2p ²P° (1)	919.351	A	20	0.00	13.43	½–	1s ²S–11p ²P° (10)
1025.722 1025.723	A A	648 324	0.00 0.00	12.04 12.04	½–1½ ½–½	1s ²S– 3p ²P° (2)	918.129	A	16	0.00	13.45	½–	1s ²S–12p ²P° (11)
972.537	A	{ 278 139	0.00 0.00	12.69 12.69	½–1½ ½–½	1s ²S– 4p ²P° (3)	917.181	A	12	0.00	13.46	½–	1s ²S–13p ²P° (12)
949.743	A	{ 144 72	0.00 0.00	13.00 13.00	½–1½ ½–½	1s ²S– 5p ²P° (4)	916.429	A	10	0.00	13.47	½–	1s ²S–14p ²P° (13)
937.804	A	{ 84 42	0.00 0.00	13.16 13.16	½–1½ ½–½	1s ²S– 6p ²P° (5)	915.824	A	8	0.00	13.48	½–	1s ²S–15p ²P° (14)
930.748	A	{ 53 26	0.00 0.00	13.26 13.26	½–1½ ½–½	1s ²S– 7p ²P° (6)	915.329	A	7	0.00	13.49	½–	1s ²S–16p ²P° (15)
926.226	A	{ 35 18	0.00 0.00	13.33 13.33	½–1½ ½–½	1s ²S– 8p ²P° (7)	914.919	A	6	0.00	13.49	½–	1s ²S–17p ²P° (16)
923.150	A	{ 25 12	0.00 0.00	13.37 13.37	½–1½ ½–½	1s ²S– 9p ²P° (8)	914.576	A	5	0.00	13.50	½–	1s ²S–18p ²P° (17)
920.963	A	27	0.00	13.40	½–	1s ²S–10p ²P° (9)							

HELIUM

He I

I P 24.48 Anal A List C July 1947

Limit 198305 ± 15

REFERENCES

- A F. Paschen, Sitz. Berlin Akad. Wiss. **30**, 662 (1929). W L, T
 B J. C. Boyce and H. A. Robinson, J. Opt. Soc. Am. **26**, 133 (1936). W L
 C F. Paschen und R. Götze, *Seriengesetze der Linienspektren* p. 28 (Julius Springer, Berlin, 1922). W L,
 (I), T
 T. Lyman, Astroph. J. **60**, 1 (1924). I

He I

He I

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac 591.420	A	3	0.00	20.87	0-1	$1s^2 \ ^1S-2p \ ^3P^o$ (1)	Vac 508.639	B	1	0.00	24.27	0-1	$1s^2 \ ^1S-8p \ ^1P^o$ (8)
584.331†	B	10	0.00	21.13	0-1	$1s^2 \ ^1S-2p \ ^1P^o$ (2)	507.712	B		0.00	24.31	0-1	$1s^2 \ ^1S-9p \ ^1P^o$ (9)
537.024	B	7	0.00	22.99	0-1	$1s^2 \ ^1S-3p \ ^1P^o$ (3)	507.053	B		0.00	24.35	0-1	$1s^2 \ ^1S-10p \ ^1P^o$ (10)
522.208	B	5	0.00	23.64	0-1	$1s^2 \ ^1S-4p \ ^1P^o$ (4)	Air 2945.104	C	(6)	-----		1-	$2s \ ^3S-5p \ ^3P^o$ (11)
515.612	B	4	0.00	23.94	0-1	$1s^2 \ ^1S-5p \ ^1P^o$ (5)				19.73	23.92		
512.094	B	3	0.00	24.11	0-1	$1s^2 \ ^1S-6p \ ^1P^o$ (6)				19.73	24.10	1-	$2s \ ^3S-6p \ ^3P^o$ (12)
509.993	B	2	0.00	24.21	0-1	$1s^2 \ ^1S-7p \ ^1P^o$ (7)	2829.073	C	(4)	19.73	24.10	1-	

He II

I P 54.17 Anal A List B April 1949

Limit 438908.670

REFERENCES

- A Wavelengths calculated from term values derived by J. E. Mack from the series formula—See *Atomic Energy Levels*, Circ. Nat. Bur. Std. 467, Vol. I p. 7 (1949). W L, T
 J. G. Brennan, unpublished material (April 1949). (Theoretical intensities calculated under the direction of J. E. Mack and F. T. Adler, for inclusion here. "The unit is micromicrowatts per excited atom")

He II

He II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
303. 781†	A	32753	0. 00	40. 64	$\frac{1}{2}-1\frac{1}{2}$	1s ² S — 2p ² P°	229. 431	A	{ 168	0. 00	53. 81	$\frac{1}{2}-1\frac{1}{2}$	1s ² S — 12p ² P°
303. 786	A	16376	0. 00	40. 64	$\frac{1}{2}-\frac{1}{2}$	(1)			{ 84	0. 00	53. 81	$\frac{1}{2}-\frac{1}{2}$	(11)
256. 317	A	10363	0. 00	48. 16	$\frac{1}{2}-1\frac{1}{2}$	1s ² S — 3p ² P°							
256. 318	A	5182	0. 00	48. 16	$\frac{1}{2}-\frac{1}{2}$	(2)							
243. 027	A	{ 4456	0. 00	50. 80	$\frac{1}{2}-1\frac{1}{2}$	1s ² S — 4p ² P°	1640. 474	A	939	40. 64	48. 16	$1\frac{1}{2}-2\frac{1}{2}$	2p ² P° — 3d ² D
		{ 2228	0. 00	50. 80	$\frac{1}{2}-\frac{1}{2}$	(3)	1640. 332	A	522	40. 64	48. 16	$\frac{1}{2}-1\frac{1}{2}$	(12)
							1640. 490	A	104	40. 64	48. 16	$1\frac{1}{2}-1\frac{1}{2}$	
237. 331	A	{ 2300	0. 00	52. 02	$\frac{1}{2}-1\frac{1}{2}$	1s ² S — 5p ² P°	1215. 171	A	404	40. 64	50. 80	$1\frac{1}{2}-2\frac{1}{2}$	2p ² P° — 4d ² D
		{ 1150	0. 00	52. 02	$\frac{1}{2}-\frac{1}{2}$	(4)	1215. 088	A	225	40. 64	50. 80	$\frac{1}{2}-1\frac{1}{2}$	(13)
							1215. 175	A	45	40. 64	50. 80	$1\frac{1}{2}-1\frac{1}{2}$	
234. 347	A	{ 1337	0. 00	52. 68	$\frac{1}{2}-1\frac{1}{2}$	1s ² S — 6p ² P°	1084. 975	A	207	40. 64	52. 02	$1\frac{1}{2}-2\frac{1}{2}$	2p ² P° — 5d ² D
		{ 668	0. 00	52. 68	$\frac{1}{2}-\frac{1}{2}$	(5)	1084. 908	A	115	40. 64	52. 02	$\frac{1}{2}-1\frac{1}{2}$	(14)
232. 584	A	{ 844	0. 00	53. 08	$\frac{1}{2}-1\frac{1}{2}$	1s ² S — 7p ² P°	1025. 302	A	120	40. 64	52. 68	$1\frac{1}{2}-2\frac{1}{2}$	2p ² P° — 6d ² D
		{ 422	0. 00	53. 08	$\frac{1}{2}-\frac{1}{2}$	(6)	1025. 241	A	66	40. 64	52. 68	$\frac{1}{2}-1\frac{1}{2}$	(15)
231. 454	A	{ 566	0. 00	53. 34	$\frac{1}{2}-1\frac{1}{2}$	1s ² S — 8p ² P°	992. 391	A	75	40. 64	53. 08	$1\frac{1}{2}-2\frac{1}{2}$	2p ² P° — 7d ² D
		{ 283	0. 00	53. 34	$\frac{1}{2}-\frac{1}{2}$	(7)	992. 334	A	42	40. 64	53. 08	$\frac{1}{2}-1\frac{1}{2}$	(16)
230. 686	A	{ 398	0. 00	53. 51	$\frac{1}{2}-1\frac{1}{2}$	1s ² S — 9p ² P°	972. 138	A	50	40. 64	53. 34	$1\frac{1}{2}-2\frac{1}{2}$	2p ² P° — 8d ² D
		{ 199	0. 00	53. 51	$\frac{1}{2}-\frac{1}{2}$	(8)	972. 083	A	28	40. 64	53. 34	$\frac{1}{2}-1\frac{1}{2}$	(17)
230. 139	A	{ 291	0. 00	53. 64	$\frac{1}{2}-1\frac{1}{2}$	1s ² S — 10p ² P°	958. 724	A	35	40. 64	53. 51	$1\frac{1}{2}-2\frac{1}{2}$	2p ² P° — 9d ² D
		{ 145	0. 00	53. 64	$\frac{1}{2}-\frac{1}{2}$	(9)	958. 671	A	20	40. 64	53. 51	$\frac{1}{2}-1\frac{1}{2}$	(18)
229. 736	A	{ 218	0. 00	53. 74	$\frac{1}{2}-1\frac{1}{2}$	1s ² S — 11p ² P°	949. 354	A	26	40. 64	53. 64	$1\frac{1}{2}-2\frac{1}{2}$	2p ² P° — 10d ² D
		{ 109	0. 00	53. 74	$\frac{1}{2}-\frac{1}{2}$	(10)	949. 301	A	14	40. 64	53. 64	$\frac{1}{2}-1\frac{1}{2}$	(19)

LITHIUM

Li I

I P 5.37 Anal A List D Aug. 1947

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Li I

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air 2741. 204	A	10R	0. 00	4. 50	$\frac{1}{2}-$	$2s\ ^2S-4p\ ^2P^\circ$ (1)
2562. 312	A	5R	0. 00	4. 82	$\frac{1}{2}-$	$2s\ ^2S-5p\ ^2P^\circ$ (2)
2475. 061	A	4R	0. 00	4. 99	$\frac{1}{2}-$	$2s\ ^2S-6p\ ^2P^\circ$ (3)
2425. 426	A	3R	0. 00	5. 09	$\frac{1}{2}-$	$2s\ ^2S-7p\ ^2P^\circ$ (4)
2394. 386	A	1R	0. 00	5. 15	$\frac{1}{2}-$	$2s\ ^2S-8p\ ^2P^\circ$ (5)

Li II

I P 75.31 Anal B List D Aug. 1947

REFERENCES

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Li II

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac 199. 282†	A	3	0. 00	61. 95	0-1	$1s^2\ ^1S-2p\ ^1P^\circ$ (1)
178. 015	A	1	0. 00	69. 35	0-1	$1s^2\ ^1S-3p\ ^1P^\circ$ (2)
171. 582	A	1	0. 00	71. 95	0-1	$1s^2\ ^1S-4p\ ^1P^\circ$ (3)
Air 2674. 4	B	2	68. 48	73. 10	1-	$3s\ ^3S-5p\ ^3P^\circ$ (4)

BERYLLIUM

Be I

I P 9.28 Anal A List C Aug. 1947

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Be I

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air 2348. 612†	A	50	0. 00	5. 25	0-1	$2s^2\ ^1S - 2p\ ^1P^\circ$ (1)
2650. 636	B	10	2. 71	7. 37	2-2	$2p\ ^3P^\circ - 2p^2\ ^3P^\dagger$ (2)
2650. 613	B	8	2. 71	7. 37	1-1	
2650. 779	B	10	2. 71	7. 37	2-1	
2650. 470	B	10	2. 71	7. 37	1-2	
2494. 735	B	20	2. 71	7. 66	2-	$2p\ ^3P^\circ - 3d\ ^3D$ (3)
2494. 590	B	12	2. 71	7. 66	1-1, 2	
2494. 547	B	8	2. 71	7. 66	0-1	
2986. 09	B	10	6. 43	10. 56	1-2	$3s\ ^3S - 3s\ ^3P^\circ$ (4)

Be II

I P 18.13 Anal A List D Aug. 1947

REFERENCES

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Be II

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac 1036. 271	A	8	0. 00	11. 91	$\frac{1}{2} - 1\frac{1}{2}$	$2s\ ^2S - 3p\ ^2P^\circ$ (1)
842. 057	A	7	0. 00	14. 66	$\frac{1}{2} -$	$2s\ ^2S - 4p\ ^2P^\circ$ (2)
1776. 339	B	8	3. 94	10. 89	$1\frac{1}{2} - \frac{1}{2}$	$2p\ ^2P^\circ - 3s\ ^2S$ (3)
1776. 118	B	6	3. 94	10. 89	$\frac{1}{2} - \frac{1}{2}$	
1512. 451	B	10	3. 94	12. 10	$1\frac{1}{2} -$	$2p\ ^2P^\circ - 3d\ ^2D$ (4)
1512. 303	B	8	3. 94	12. 10	$\frac{1}{2} - 1\frac{1}{2}$	
1197. 19	A	10	3. 94	14. 25	$1\frac{1}{2} - \frac{1}{2}$	$2p\ ^2P^\circ - 4s\ ^2S$ (5)
Air 2453. 89	A	3	10. 89	15. 92	$\frac{1}{2} -$	$3s\ ^2S - 5p\ ^2P^\circ$ (6)
2728. 83	A	4	12. 10	16. 63		$3d\ ^2D - 6f\ ^2F^\circ$ (7)

BORON

B I

I P 8.26 Anal B List D Aug. 1947

REFERENCES

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B I

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air 2497. 724† 2496. 773	A A	10R 8R	0. 00 0. 00	4. 94 4. 94	$1\frac{1}{2}-\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$2p\ ^2P^{\circ}-3s\ ^2S$ (1)
2089. 57 2088. 84	B B	(10n) (9n)	0. 00 0. 00	5. 91 5. 91	$1\frac{1}{2}-2\frac{1}{2}$ $\frac{1}{2}-1\frac{1}{2}$	$2p\ ^2P^{\circ}-2p^2\ ^2D$ (2)
Vac 1826. 40 1825. 89	C C	(20h) (15h)	0. 00 0. 00	6. 76 6. 76	$1\frac{1}{2}-2\frac{1}{2}$ $\frac{1}{2}-1\frac{1}{2}$	$2p\ ^2P^{\circ}-3d\ ^2D$ (3)

B II

I P 25.02 Anal B List D Aug. 1947

REFERENCES

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B II

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac 1362. 460†	A	5	0. 00	9. 06	0-1	$2s^2\ ^1S-2p\ ^1P^{\circ}$ (1)
693. 952	A	2	0. 00	17. 79	0-1	$2s^2\ ^1S-3p\ ^1P^{\circ}$ (2)
*1623. 99 1624. 37 1623. 57	A A A	5 4 4	4. 61 4. 61 4. 61	12. 21 12. 21 12. 21	$\left\{ \begin{array}{l} 2-2 \\ 1-1 \\ 2-1 \\ 1-2 \end{array} \right\}$	$2p\ ^3P^{\circ}-2p^2\ ^3P^{\dagger}$ (3)
Air 2395. 06	A	5	12. 64	17. 79	2-1	$2p^2\ ^1D-3p\ ^1P^{\circ}$ (4)

CARBON

C I

I P 11.20 Anal A List B Sept. 1947

REFERENCES

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C I

C I

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air							Vac						
2967.224	A	5	0.01	4.16	2-2	$2p^2\ ^3P-2p^3\ ^5S^\circ$	1194.494	B	7	0.01	10.34	2-3	$2p^2\ ^3P-4d\ ^3F^\circ$
2964.846	A	2	0.00	4.16	1-2	(1)							(10)
Vac							1193.284	B	10	0.01	10.35	2-3	$2p^2\ ^3P-4d\ ^3D^\circ$
1656.998†	A	10	0.01	7.46	2-2	$2p^2\ ^3P-3s\ ^3P^\circ$	1193.005	B	8	0.00	10.35	1-2	(11)
1657.368	A	2	0.00	7.45	1-1	(2)	1192.923	B	2	0.00	10.35	0-1	
1658.113	A	5	0.01	7.45	2-1		1193.460	B	3	0.01	10.35	2-2	
1657.891	A	4	0.00	7.45	1-0								
1656.255	A	5	0.00	7.46	1-2		1192.480	B	2	0.00	10.36	1-1	$2p^2\ ^3P-5s\ ^1P^\circ$
1656.918	A	3	0.00	7.45	0-1								(12)
1561.40	C	20d	0.01	7.91	2-3	$2p^2\ ^3P-2p^3\ ^3D^\circ$	1191.855	B	1	0.01	10.36	2-3	$2p^2\ ^3P-4d\ ^1F^\circ$
*1560.702	C	15d	0.00	7.91	1-2	(3)							(13)
1560.313	C	8d	0.00	7.91	0-1		1189.660	B	6	0.01	10.38	2-2	$2p^2\ ^3P-4d\ ^3P^\circ$
1561.292	D	(2)	0.01	7.91	2-2		1189.074	B	3	0.00	10.38	1-1	(14)
*1650.702	C	15d	0.00	7.91	1-1		1189.556	B	4	0.01	10.38	2-1	
1329.58	D	(6)	0.01	9.29	2-	$2p^2\ ^3P-2p^3\ ^3P^\circ$	1188.935	B	1	0.00	10.38	0-1	
1329.099	C	5	0.00	9.29	1-	(4)							
1328.820	C	3	0.00	9.29	0-1		1159.004	B	5	0.01	10.66	2-3	$2p^2\ ^3P-5d\ ^3F^\circ$
							1158.729	B	3	0.00	10.66	1-2	(15)
*1280.340	D	6	{0.01 0.00	9.65 9.64	2-2 1-1	$2p^2\ ^3P-4s\ ^3P^\circ$	1158.107	B	8	0.01	10.67	2-3	$2p^2\ ^3P-5d\ ^3D^\circ$
1280.892	B	4	0.01	9.64	2-1	(5)	1158.017	B	7	0.00	10.66	1-2	(16)
1280.646	B	2	0.00	9.64	1-0		1158.398	B	2	0.01	10.66	2-2	
1279.898	B	5	0.00	9.65	1-2		1157.825	B	3	0.01	10.67	2-1	$2p^2\ ^3P-6s\ ^1P^\circ?$
1280.154	B	2	0.00	9.64	0-1		1157.391	B	2	0.00	10.67	1-1	(17)
1279.251	B	6	0.01	9.66	2-3	$2p^2\ ^3P-3d\ ^3F^\circ$	1157.333	B	1	0.01	10.67	2-3	$2p^2\ ^3P-5d\ ^1F^\circ$
						(6)							(18)
1277.617	B	10	0.01	9.67	2-3	$2p^2\ ^3P-3d\ ^3D^\circ$	1156.619	B	5	0.01	10.68	2-2	$2p^2\ ^3P-5d\ ^3P^\circ$
1277.274	D	9	0.00	9.67	1-2	(7)	1156.059	B	2	0.00	10.68	1-1	(19)
1277.154	B	2	0.00	9.67	0-1		1156.502	B	1	0.01	10.68	2-1?	
1277.766	B	3	0.01	9.67	2-2		1155.839	B	1	0.00	10.68	0-1	
1274.131	B	5	0.01	9.69	2-3	$2p^2\ ^3P-3d\ ^1F^\circ$	1141.705	B	1	0.01	10.82	2-2	$2p^2\ ^3P-6d\ ^1D^\circ$
						(8)							(20)
1261.560	D	8	0.01	9.79	2-2	$2p^2\ ^3P-3d\ ^3P^\circ$	1140.688	B	3	0.01	10.83	2-3	$2p^2\ ^3P-6d\ ^3F^\circ$
1260.955	D	6	0.00	9.79	1-1	(9)	1140.391	B	1	0.00	10.83	1-2	(21)
1261.12	D	7	0.00	9.79	1-2								
1260.745	B	4	0.00	9.79	0-1								

C I—Continued

C I—Continued

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1139. 894	B	7	0. 01	10. 84	2-3	$2p^2\ ^3P-6d\ ^2D^\circ$	1315. 903	B	4	1. 26	10. 64	2-2	$2p^2\ ^1D-5d\ ^1D^\circ$
1139. 794	B	6	0. 00	10. 83	1-2	(22)							(44)
1140. 070	B	1	0. 01	10. 83	2-2		1313. 471	B	6	1. 26	10. 66	2-3	$2p^2\ ^1D-5d\ ^3F^\circ?$
1139. 142	B	2	0. 01	10. 84	2-2	$2p^2\ ^3P-6d\ ^3P^\circ$							(45)
1138. 625	B	1	0. 00	10. 84	1-1	(23)	1312. 261	B	2	1. 26	10. 67	2-3	$2p^2\ ^1D-5d\ ^3D^\circ$
1139. 037	B	1	0. 01	10. 84	2-1								(46)
1129. 927	B	1	0. 01	10. 93	2-3	$2p^2\ ^3P-7d\ ^3F^\circ$	1311. 985	B	2	1. 26	10. 67	2-1	$2p^2\ ^1D-6s\ ^1P^\circ$
1129. 626	B	1	0. 00	10. 93	1-2	(24)							(47)
1129. 161	B	6	0. 01	10. 94	2-3	$2p^2\ ^3P-7d\ ^3D^\circ$	1311. 374	B	8	1. 26	10. 67	2-3	$2p^2\ ^1D-5d\ ^1F^\circ$
1128. 748	B	1	0. 01	10. 94	2-2	$2p^2\ ^3P-7d\ ^3P^\circ$							(48)
						(26)	1310. 646	B	4	1. 26	10. 68	2-1	$2p^2\ ^1D-5d\ ^1P^\circ$
1122. 325	B	4	0. 01	11. 01	2-3	$2p^2\ ^3P-8d\ ^3D^\circ$							(49)
						(27)	1291. 380	B	1	1. 26	10. 82	2-2	$2p^2\ ^1D-6d\ ^1D^\circ$
1122. 179	B	1	0. 01	11. 01	2-2	$2p^2\ ^3P-8d\ ^3P^\circ$							(50)
						(28)	1289. 983	B	3	1. 26	10. 83	2-3	$2p^2\ ^1D-6d\ ^3F^\circ$
1117. 706	B	3	0. 01	11. 05	2-3	$2p^2\ ^3P-9d\ ^3D^\circ$							(51)
						(29)	1288. 633	B	2	1. 26	10. 84	2-1	$2p^2\ ^1D-7s\ ^1P^\circ$
1114. 414	B	2	0. 01	11. 08	2-3	$2p^2\ ^3P-10d\ ^3D^\circ$							(52)
						(30)	1288. 445	B	5	1. 26	10. 84	2-3	$2p^2\ ^1D-6d\ ^1F^\circ$
945. 566	D	(3)	0. 01	13. 06	2-1	$2p^2\ ^3P-2p^3\ ^3S^\circ$							(53)
945. 336	D	(2)	0. 00	13. 06	1-1	(31)	1288. 055	B	1	1. 26	10. 84	2-1	$2p^2\ ^1D-6d\ ^1P^\circ$
945. 193	D	(1)	0. 00	13. 06	0-1								(54)
							1275. 021	B	5	1. 26	10. 94	2-3	$2p^2\ ^1D-7d\ ^1F^\circ$
1993. 65	E	2	1. 26	7. 45	2-1	$2p^2\ ^1D-3s\ ^3P^\circ$							(55)
						(32)	1274. 880	B	2	1. 26	10. 94	2-1	$2p^2\ ^1D-7d\ ^1P^\circ$
1930. 930	B	10	1. 26	7. 65	2-1	$2p^2\ ^1D-3s\ ^1P^\circ$							(56)
						(33)	1267. 633	B	1	1. 26	11. 00	2-	$2p^2\ ^1D-8d\ ^3F^\circ$
1481. 771	B	7	1. 26	9. 59	2-2	$2p^2\ ^1D-3d\ ^1D^\circ$							(57)
						(34)	1266. 449	B	3	1. 26	11. 01	2-3	$2p^2\ ^1D-8d\ ^1F^\circ$
1470. 20	E	1	1. 26	9. 66	2-3	$2p^2\ ^1D-3d\ ^3F^\circ$							(58)
						(35)	1260. 670	B	2	1. 26	11. 05	2-3	$2p^2\ ^1D-9d\ ^1F^\circ$
1467. 450	B	3	1. 26	9. 67	2-1	$2p^2\ ^1D-4s\ ^1P^\circ$							(59)
						(36)							
1463. 328	B	6	1. 26	9. 69	2-3	$2p^2\ ^1D-3d\ ^1F^\circ$	Air						
						(37)	2582. 901	A	5	2. 67	7. 45	0-1	$2p^2\ ^1S-3s\ ^3P^\circ$
1459. 054	B	2	1. 26	9. 72	2-1	$2p^2\ ^1D-3d\ ^1P^\circ$							(60)
						(38)	2478. 556	F	10	2. 67	7. 65	0-1	$2p^2\ ^1S-3s\ ^1P^\circ$
1364. 140	B	6	1. 26	10. 31	2-2	$2p^2\ ^1D-4d\ ^1D^\circ$							(61)
						(39)	Vac						
1359. 329	B	2	1. 26	10. 34	2-3	$2p^2\ ^1D-4d\ ^3F^\circ$	1751. 9	B	8	2. 67	9. 72	0-1	$2p^2\ ^1S-3d\ ^1P^\circ$
						(40)							(62)
1357. 058	B	3	1. 26	10. 36	2-1	$2p^2\ ^1D-5s\ ^1P^\circ$	1602. 984	B	5	2. 67	10. 37	0-1	$2p^2\ ^1S-4d\ ^1P^\circ$
						(41)							(63)
1355. 825	B	6	1. 26	10. 36	2-3	$2p^2\ ^1D-4d\ ^1F^\circ$	1542. 202	B	2	2. 67	10. 68	0-1	$2p^2\ ^1S-5d\ ^1P^\circ$
						(42)							(64)
1354. 286	D	(0)	1. 26	10. 37	2-1	$2p^2\ ^1D-4d\ ^1P^\circ$							
						(43)	1431. 595	A	20	4. 16	12. 79	2-3	$2p^3\ ^5S^\circ-3s\ ^5P$
							1432. 115	A	15	4. 16	12. 78	2-2	(65)
							1432. 538	A	10	4. 16	12. 78	2-1	

C II

I P 24.28 Anal A List C Sept. 1947

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C II

C II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1335. 684†	A	14	0. 01	9. 25	1½—2½	2p ²P°—2p² ²D	651. 342	A	8	5. 31	24. 27	2½—3½	2p² ²P —3d ²D°
1334. 515	A	13	0. 00	9. 25	½—1½	(1)	*651. 262	A	7	5. 31	24. 27	1½—2½	(9)
1037. 017	A	13	0. 01	11. 91	1½— ½	2p ²P°—2p² ²S	*651. 216	A	7	5. 31	24. 27	½—1½	
1036. 330	A	12	0. 00	11. 91	½— ½	(2)	*651. 262	A	7	5. 31	24. 27	1½—1½	
904. 134	A	12	0. 01	13. 66	1½—1½	2p ²P°—2p² ²P	*651. 216	A	7	5. 31	24. 26	½— ½	
903. 950	A	11	0. 00	13. 66	½— ½	(3)							
904. 468	A	10	0. 01	13. 66	1½— ½		1760. 40	A	4	9. 25	16. 26	2½—1½	2p² ²D —3p ²P°
903. 609	A	10	0. 00	13. 66	½—1½		1760. 81	A	3	9. 25	16. 26	1½— ½	(10)
858. 561	A	9	0. 01	14. 39	1½— ½	2p ²P°—3s ²S	1323. 916	A	8	9. 25	18. 57		2p² ²D —2p³ ²D°
858. 094	A	8	0. 00	14. 39	½— ½	(4)							(11)
687. 355	A	11	0. 01	17. 97	1½—2½	2p ²P°—3d ²D	1065. 883	A	7	9. 25	20. 83	2½—1½	2p² ²D —2p³ ²P°
687. 059	A	10	0. 00	17. 97	½—1½	(5)	1066. 121	A	6	9. 25	20. 83	1½— ½	(12)
595. 032	A	7d	0. 01	20. 75	1½—2½	2p ²P°—4d ²D							
594. 808	A	6d	0. 00	20. 75	½—1½	(6)	Air						
							2836. 710	B	8	11. 91	16. 26	½—1½	2p² ²S —3p ²P°
							2837. 602	B	7	11. 91	16. 26	½— ½	(13)
1010. 369	A	10	5. 31	17. 53	2½—1½	2p² ²P —2p³ ²S°							
1010. 074	A	10	5. 31	17. 53	1½—1½	(7)							
1009. 854	A	9	5. 31	17. 53	½—1½		2512. 03	B	10	13. 66	18. 57	1½—2½	2p² ²P —2p³ ²D°
*806. 555	A	7	5. 31	20. 62	2½—2½	2p² ²P —3s ²P°	2509. 11	B	9	13. 66	18. 58	½—1½	(14)
*806. 684	A	4	{ 5. 31	20. 61	1½—1½	(8)	2511. 71	B	7	13. 66	18. 58	1½—1½	
			{ 5. 31	20. 61	½— ½								
*806. 846	A	6	{ 5. 31	20. 61	2½—1½								
			{ 5. 31	20. 61	1½— ½								
806. 384	A	5	5. 31	20. 62	1½—2½		2747. 31	B	6	16. 26	20. 75	1½—2½	3p ²P°—4d ²D
*806. 555	A	7	5. 31	20. 61	½—1½		2746. 50	B	5	16. 26	20. 75	½—1½	(15)

C III

I P 47.67 Anal A List C Sept. 1947

REFERENCE

A B. Edlén, Nova Acta Reg. Soc. Sci. Uppsala [IV]
9, No. 6, 55 (1934). W L, I, T

C III

C III

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)	
			Low	High						Low	High			
Vac 977. 026	A	18	0. 00	12. 64	0-1	$2s^2 \ ^1S - 2p \ ^1P^\circ$ (1)	Air 2296. 89	A	20	12. 64	18. 01	1-2	$2p \ ^1P^\circ - 2p^2 \ ^1D$ (8)	
386. 203	A	14	0. 00	31. 97	0-1	$2s^2 \ ^1S - 3p \ ^1P^\circ$ (2)	Vac 1247. 368	A	10	12. 64	22. 53	1-0	$2p \ ^1P^\circ - 2p^2 \ ^1S$ (9)	
310. 171	A	7	0. 00	39. 80	0-1	$2s^2 \ ^1S - 4p \ ^1P^\circ$ (3)	690. 526	A	7	12. 64	30. 51	1-0	$2p \ ^1P^\circ - 3s \ ^1S$ (10)	
1175. 700	A	14	6. 47	16. 97	2-2	$2p \ ^3P^\circ - 2p^2 \ ^3P$ (4)	574. 279	A	12	12. 64	34. 13	1-2	$2p \ ^1P^\circ - 3d \ ^1D$ (11)	
1175. 566	A	12	6. 46	16. 96	1-1									
1176. 351	A	12	6. 47	16. 96	2-1									
1175. 973	A	12	6. 46	16. 96	1-0									
1174. 916	A	12	6. 46	16. 97	1-2									
1175. 248	A	12	6. 46	16. 96	0-1		Air 2610. 02 2614. 49 2616. 66	A A A	3 2 1	33. 33 33. 33 33. 33	38. 05 38. 04 38. 04	$3, 2-2$ $2, 1-1$ 1-0	$3d \ ^3D - 3s \ ^3P^\circ$ (12)	
538. 312	A	13	6. 47	29. 39	2-1	$2p \ ^3P^\circ - 3s \ ^3S$ (5)	2982. 20	A	5	34. 13	38. 27	2-1		$3d \ ^1D - 3s \ ^1P^\circ$ (13)
538. 150	A	12	6. 46	29. 39	1-1									
538. 075	A	11	6. 46	29. 39	0-1									
459. 633	A	15	6. 47	33. 33	2-2, 3	$2p \ ^3P^\circ - 3d \ ^3D$ (6)								
459. 521	A	14	6. 46	33. 33	1-1, 2									
459. 462	A	13	6. 46	33. 33	0-1									
371. 747	A	10	6. 47	39. 67	2-3	$2p \ ^3P^\circ - 4d \ ^3D$ (7)								
*371. 694	A	10	6. 46	39. 67	1-2									
371. 784	A	8	6. 46	39. 66	0-1									
			6. 47	39. 67	2-2									
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C IV

I P 64.22 Anal A List C Sept. 1947

REFERENCE

A B. Edlén, Nova Acta Reg. Soc. Sci. Uppsala [IV]
9, No. 6, 41 (1934). W L, I, T

C IV

C IV

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1548. 195	A	20	0. 00	7. 97	$\frac{1}{2}-1\frac{1}{2}$	$2s \ ^2S - 2p \ ^2P^{\circ}$	289. 230	A	10	7. 97	50. 66	$1\frac{1}{2}-2\frac{1}{2}$	$2p \ ^2P^{\circ} - 4d \ ^2D$
1550. 768	A	19	0. 00	7. 96	$\frac{1}{2}-\frac{1}{2}$	(1)	289. 143	A	9	7. 96	50. 66	$\frac{1}{2}-1\frac{1}{2}$	(9)
312. 418	A	15	0. 00	39. 51	$\frac{1}{2}-1\frac{1}{2}$	$2s \ ^2S - 3p \ ^2P^{\circ}$	259. 542	A	7	7. 97	55. 54	$1\frac{1}{2}-2\frac{1}{2}$	$2p \ ^2P^{\circ} - 5d \ ^2D$
312. 455	A	14	0. 00	39. 51	$\frac{1}{2}-\frac{1}{2}$	(2)	259. 471	A	6	7. 96	55. 54	$\frac{1}{2}-1\frac{1}{2}$	(10)
244. 907	A	10	0. 00	50. 41	$\frac{1}{2}-$	$2s \ ^2S - 4p \ ^2P^{\circ}$	245. 830	A	5d	7. 97	58. 19	$1\frac{1}{2}-2\frac{1}{2}$	$2p \ ^2P^{\circ} - 6d \ ^2D$
						(3)	245. 775	A	4d	7. 96	58. 19	$\frac{1}{2}-1\frac{1}{2}$	(11)
222. 791	A	7	0. 00	55. 41	$\frac{1}{2}-$	$2s \ ^2S - 5p \ ^2P^{\circ}$	Air 2698. 70 2697. 73	A	3 2	-----		$1\frac{1}{2}-\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$4p \ ^2P^{\circ} - 5s \ ^2S$ (12)
						(4)				50. 41	54. 98		
212. 421	A	5	0. 00	58. 12	$\frac{1}{2}-$	$2s \ ^2S - 6p \ ^2P^{\circ}$	2697. 73	A	2	50. 41	54. 98	$\frac{1}{2}-\frac{1}{2}$	(12)
						(5)				-----			
419. 714	A	14	7. 97	37. 39	$1\frac{1}{2}-\frac{1}{2}$	$2p \ ^2P^{\circ} - 3s \ ^2S$	2595. 14	A	2d	50. 66	55. 41		$4d \ ^2D - 5p \ ^2P^{\circ}$
419. 525	A	13	7. 96	37. 39	$\frac{1}{2}-\frac{1}{2}$	(6)							(13)
384. 178	A	17	7. 97	40. 11	$1\frac{1}{2}-2\frac{1}{2}$	$2p \ ^2P^{\circ} - 3d \ ^2D$	2524. 40	A	4d	50. 66	55. 54		$4d \ ^2D - 5f \ ^2F^{\circ}$
384. 032	A	16	7. 96	40. 11	$\frac{1}{2}-1\frac{1}{2}$	(7)							(14)
296. 951	A	7	7. 97	49. 55	$1\frac{1}{2}-\frac{1}{2}$	$2p \ ^2P^{\circ} - 4s \ ^2S$	2529. 97	A	6d	-----			$4f \ ^2F^{\circ} - 5g \ ^2G$ (15)
296. 857	A	6	7. 96	49. 55	$\frac{1}{2}-\frac{1}{2}$	(8)				50. 67	55. 55		

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N I

I P 14.49 Anal A List D Oct. 1947

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N I

N I

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1199.550	A	6	0.00	10.29	$1\frac{1}{2}-2\frac{1}{2}$	$2p^3\ ^4S^{\circ}-3s\ ^4P$	1163.870	A	9	2.37	12.98	$-2\frac{1}{2}$	$2p^3\ ^2D^{\circ}-3d\ ^2D^{\dagger}$
1200.218	A	10	0.00	10.29	$1\frac{1}{2}-1\frac{1}{2}$	(1)	1164.314	A	9	2.37	12.98	$-1\frac{1}{2}$	(7)
1200.707	A	10	0.00	10.28	$1\frac{1}{2}-\frac{1}{2}$								
1134.979 $\frac{1}{2}$	A	10	0.00	10.88	$1\frac{1}{2}-2\frac{1}{2}$	$2p^3\ ^4S^{\circ}-2p^4\ ^4P$							
1134.417	A	10	0.00	10.88	$1\frac{1}{2}-1\frac{1}{2}$	(2)	1836.739	E	4	3.56	10.28	$-\frac{1}{2}$	$2p^3\ ^2P^{\circ}-3s\ ^4P$
1134.168	A	10	0.00	10.88	$1\frac{1}{2}-\frac{1}{2}$								(8)
963.93	B	10	0.00	12.81	$1\frac{1}{2}-2\frac{1}{2}$	$2p^3\ ^4S^{\circ}-4s\ ^4P$	1742.734	C	10	3.56	10.64	$-1\frac{1}{2}$	$2p^3\ ^2P^{\circ}-3s\ ^2P$
964.57	B	10	0.00	12.80	$1\frac{1}{2}-1\frac{1}{2}$	(3)	1745.246	C	10	3.56	10.63	$-\frac{1}{2}$	(9)
965.07	B	10	0.00	12.79	$1\frac{1}{2}-\frac{1}{2}$								$2p^3\ ^2P^{\circ}-3s'\ ^2D$
							1411.937	C	10	3.56	12.30		(10)
1492.630	C	10	2.37	10.64	$-1\frac{1}{2}$	$2p^3\ ^2D^{\circ}-3s\ ^2P$	1326.629	D	10	3.56	12.87	$-1\frac{1}{2}$	$2p^3\ ^2P^{\circ}-4s\ ^2P$
1494.669	C	10	2.37	10.63	$1\frac{1}{2}-\frac{1}{2}$	(4)	1327.960	D	10	3.56	12.86	$-\frac{1}{2}$	(11)
1243.170	C	8	2.37	12.30	$-2\frac{1}{2}$	$2p^3\ ^2D^{\circ}-3s'\ ^2D$	1319.717	E	8	3.56	12.91	$-1\frac{1}{2}$	$2p^3\ ^2P^{\circ}-3d\ ^2P$
1243.297	C	8	2.37	12.30	$-1\frac{1}{2}$	(5)	1319.039	E	8	3.56	12.92	$-\frac{1}{2}$	(12)
1167.442	A	8	2.37	12.95	$2\frac{1}{2}-3\frac{1}{2}$	$2p^3\ ^2D^{\circ}-3d\ ^2F^{\dagger}$	1310.569	D	10	3.56	12.98	$1\frac{1}{2}-2\frac{1}{2}$	$2p^3\ ^2P^{\circ}-3d\ ^2D$
1168.477	D	8	2.37	12.94	$-2\frac{1}{2}$	(6)	1310.967	D	10	3.56	12.98	$-1\frac{1}{2}$	(13)

N II

I P 29.49 Anal A List C Oct. 1947

REFERENCES

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N II

N II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1085.699†	A	12	0.02	11.39	2-3	$2p^2\ ^3P - 2p^3\ ^3D^\circ$	574.650	A	6	1.89	23.37	2-3	$2p^2\ ^1D - 3d\ ^1F^\circ$
*1084.568	A	11	0.01	11.39	1-2	(1)							(11)
1083.977	A	10	0.00	11.39	0-1								
1085.536	A	10	0.02	11.39	2-2		745.836	A	6	4.04	20.59	0-1	$2p^2\ ^1S - 2p^3\ ^1P^\circ$
*1084.568	A	11	0.01	11.39	1-1								(12)
*916.700	A	12	0.02	13.48	2-2	$2p^2\ ^3P - 2p^3\ ^3P^\circ$	635.180	A	5	4.04	23.47	0-1	$2p^2\ ^1S - 3d\ ^1P^\circ$
*916.004	A	11	0.01	13.48	1-1	(2)							(13)
*916.700	A	12	0.02	13.48	2-1								
915.955	A	10	0.01	13.48	1-0								
*916.004	A	11	0.01	13.48	1-2		1886.82	C	4	18.42	24.96	1-1	$3s\ ^1P^\circ - 4p\ ^1P$
915.603	A	10	0.00	13.48	0-1								(14)
*671.391	A	8	0.02	18.40	2-2	$2p^2\ ^3P - 3s\ ^3P^\circ$							
671.629	A	6	0.01	18.39	1-1	(3)	Air						
671.999	A	6	0.02	18.39	2-1		2206.10	C	3	20.32	25.92	1-2	$3p\ ^1P - 4d\ ^1D^\circ$
671.770	A	6	0.01	18.38	1-0								(15)
671.014	A	6	0.01	18.40	1-2		2317.01	C	5	20.58	25.90	3-4	$3p\ ^3D - 4d\ ^3F^\circ\dagger$
*671.391	A	8	0.00	18.39	0-1		2316.46	C	4	20.56	25.89	2-3	(16)
645.167	A	10	0.02	19.15	2-1	$2p^2\ ^3P - 2p^3\ ^3S^\circ$	2316.65	C	3	20.56	25.88	1-2	
644.825	A	9	0.01	19.15	1-1	(4)							
644.621	A	8	0.00	19.15	0-1								
533.726	A	6	0.02	23.15	2-3	$2p^2\ ^3P - 3d\ ^3D^\circ$							
533.577	A	5	0.01	23.14	1-2	(5)	2823.67	B	4	20.59	24.96	1-1	$2p^3\ ^1P^\circ - 4p\ ^1P$
533.504	A	4	0.00	23.14	0-1								(17)
533.809	A	4	0.02	23.14	2-2		2590.91	B	4	20.59	25.35	1-2	$2p^3\ ^1P^\circ - 4p\ ^1D$
533.644	A	4	0.01	23.14	1-1								(18)
529.860	A	5	0.02	23.31	2-2	$2p^2\ ^3P - 3d\ ^3P^\circ$							
529.481	A	3	0.01	23.32	1-1	(6)	2522.27	B	4	21.07	25.96	2-3	$3p\ ^3P - 4d\ ^3D^\circ\dagger$
529.713	A	3	0.02	23.32	2-1		2520.85	B	3	21.06	25.96	1-2	(19)
529.405	A	3	0.01	23.32	1-0		2520.27	B	2	21.06	25.95	0-1	
529.627	A	3	0.01	23.31	1-2								
529.343	A	3	0.00	23.32	0-1		2496.88	B	4	21.07	26.01	2-2	$3p\ ^3P - 4d\ ^3P^\circ\dagger$
							2490.37	B	2	21.06	26.02	1-1	(20)
775.957	A	12	1.89	17.80	2-2	$2p^2\ ^1D - 2p^3\ ^1D^\circ$							
						(7)							
746.976	A	8	1.89	18.42	2-1	$2p^2\ ^1D - 3s\ ^1P^\circ$	2799.20	B	4	21.51	25.92	2-2	$3p\ ^1D - 4d\ ^1D^\circ$
						(8)							(21)
660.280	A	9	1.89	20.59	2-1	$2p^2\ ^1D - 2p^3\ ^1P^\circ$	2709.82	B	6	21.51	26.06	2-3	$3p\ ^1D - 4d\ ^1F^\circ$
						(9)							(22)
582.150	A	5	1.89	23.10	2-2	$2p^2\ ^1D - 3d\ ^1D^\circ$	2461.30	B	3	21.51	26.52	2-1	$3p\ ^1D - 5s\ ^1P^\circ$
						(10)							(23)

N III

I P 47.24 Anal A List C Oct. 1947

REFERENCES

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N III

N III

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
991. 579	A	17	0. 02	12. 47	$1\frac{1}{2}-2\frac{1}{2}$	$2p\ ^2P^\circ-2p^2\ ^2D$	434. 066	A	7	7. 08	35. 52	$2\frac{1}{2}-2\frac{1}{2}$	$2p^2\ ^4P-3s\ ^4P^\circ$
989. 790	A	16	0. 00	12. 47	$\frac{1}{2}-1\frac{1}{2}$	(1)	*434. 129	A	5	7. 07	35. 50	$1\frac{1}{2}-1\frac{1}{2}$	(9)
991. 514	A	14	0. 02	12. 47	$1\frac{1}{2}-1\frac{1}{2}$					7. 06	35. 50	$\frac{1}{2}-\frac{1}{2}$	
764. 357	A	15	0. 02	16. 17	$1\frac{1}{2}-\frac{1}{2}$	$2p\ ^2P^\circ-2p^2\ ^2S$	434. 280	A	6	7. 08	35. 50	$2\frac{1}{2}-1\frac{1}{2}$	
763. 340	A	14	0. 00	16. 17	$\frac{1}{2}-\frac{1}{2}$	(2)	434. 246	A	6	7. 07	35. 50	$1\frac{1}{2}-\frac{1}{2}$	
							433. 911	A	6	7. 07	35. 52	$1\frac{1}{2}-2\frac{1}{2}$	
							434. 014	A	6	7. 06	35. 50	$\frac{1}{2}-1\frac{1}{2}$	
685. 816	A	16	0. 02	18. 02	$1\frac{1}{2}-1\frac{1}{2}$	$2p\ ^2P^\circ-2p^2\ ^2P$	362. 946	A	8	7. 08	41. 09	$2\frac{1}{2}-3\frac{1}{2}$	$2p^2\ ^4P-3d\ ^4D^\circ$
685. 513	A	15	0. 00	18. 01	$\frac{1}{2}-\frac{1}{2}$	(3)	*362. 881	A	8	7. 07	41. 09	$1\frac{1}{2}-2\frac{1}{2}$	(10)
686. 335	A	14	0. 02	18. 01	$1\frac{1}{2}-\frac{1}{2}$		*362. 833	A	7	7. 06	41. 09	$\frac{1}{2}-1\frac{1}{2}$	
684. 996	A	14	0. 00	18. 02	$\frac{1}{2}-1\frac{1}{2}$		362. 985	A	6	7. 08	41. 09	$2\frac{1}{2}-2\frac{1}{2}$	
452. 226	A	11	0. 02	27. 32	$1\frac{1}{2}-\frac{1}{2}$	$2p\ ^2P^\circ-3s\ ^2S$	*362. 881	A	8	7. 07	41. 09	$1\frac{1}{2}-1\frac{1}{2}$	
451. 869	A	10	0. 00	27. 32	$\frac{1}{2}-\frac{1}{2}$	(4)	*362. 833	A	7	7. 06	41. 08	$\frac{1}{2}-\frac{1}{2}$	
374. 441	A	12	0. 02	32. 99	$1\frac{1}{2}-2\frac{1}{2}$	$2p\ ^2P^\circ-3d\ ^2D$	358. 578	A	6	7. 08	41. 51	$2\frac{1}{2}-2\frac{1}{2}$	$2p^2\ ^4P-3d\ ^4P^\circ$
374. 204	A	11	0. 00	32. 99	$\frac{1}{2}-1\frac{1}{2}$	(5)	358. 401	A	3	7. 07	41. 51	$1\frac{1}{2}-1\frac{1}{2}$	(11)
323. 615	A	6	0. 02	38. 17	$1\frac{1}{2}-1\frac{1}{2}$	$2p\ ^2P^\circ-3p\ ^2P$	358. 278	A	3	7. 06	41. 52	$\frac{1}{2}-\frac{1}{2}$	
323. 488	A	5	0. 00	38. 16	$\frac{1}{2}-\frac{1}{2}$	(6)	358. 509	A	5	7. 08	41. 51	$2\frac{1}{2}-1\frac{1}{2}$	
323. 671	A	4	0. 02	38. 16	$1\frac{1}{2}-\frac{1}{2}$		358. 356	A	5	7. 07	41. 52	$1\frac{1}{2}-\frac{1}{2}$	
323. 431	A	4	0. 00	38. 17	$\frac{1}{2}-1\frac{1}{2}$		358. 469	A	5	7. 07	41. 51	$1\frac{1}{2}-2\frac{1}{2}$	
314. 850	A	9	0. 02	39. 23	$1\frac{1}{2}-2\frac{1}{2}$	$2p\ ^2P^\circ-4d\ ^2D$	358. 327	A	5	7. 06	41. 51	$\frac{1}{2}-1\frac{1}{2}$	
314. 715	A	8	0. 00	39. 23	$\frac{1}{2}-1\frac{1}{2}$	(7)							
314. 877	A	6	0. 02	39. 23	$1\frac{1}{2}-1\frac{1}{2}$								
772. 385	A	12	7. 08	23. 06	$2\frac{1}{2}-1\frac{1}{2}$	$2p^2\ ^4P-2p^3\ ^4S^\circ$	979. 919	A	9	12. 47	25. 07	$2\frac{1}{2}-2\frac{1}{2}$	$2p^2\ ^2D-2p^3\ ^2D^\circ$
771. 901	A	11	7. 07	23. 06	$1\frac{1}{2}-1\frac{1}{2}$	(8)	979. 842	A	8	12. 47	25. 07	$1\frac{1}{2}-1\frac{1}{2}$	(12)
771. 544	A	10	7. 06	23. 06	$\frac{1}{2}-1\frac{1}{2}$		772. 891	A	9	12. 47	28. 44	$2\frac{1}{2}-1\frac{1}{2}$	$2p^2\ ^2D-2p^3\ ^2P^\circ$
							772. 975	A	8	12. 47	28. 44	$1\frac{1}{2}-\frac{1}{2}$	(13)
							509. 586	A	5	12. 47	36. 70	$2\frac{1}{2}-1\frac{1}{2}$	$2p^2\ ^2D-3s\ ^2P^\circ$
							509. 897	A	4	12. 47	36. 68	$1\frac{1}{2}-\frac{1}{2}$	(14)

N III—Continued

N III—Continued

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac 428.180 428.244	A A	6 5	12.47 12.47	41.30 41.30	$2\frac{1}{2}-2\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$2p^2 \ ^2D-3d \ ^2D^\circ$ (15)	Vac 1885.25	A	10	32.99 39.54			$3d \ ^2D-4f \ ^2F^\circ$ (24)
418.705 418.910	A A	7 6	12.47 12.47	41.96 41.94	$2\frac{1}{2}-3\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$	$2p^2 \ ^2D-3d \ ^2F^\circ$ (16)	Air 2983.58 2972.60	B B	5 (4)	38.17 38.16	42.31 42.31	$1\frac{1}{2}-1\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$3p \ ^2P-3d \ ^2P^\circ$ (25)
1006.015	A	6	16.17	28.44	$\frac{1}{2}-$	$2p^2 \ ^2S-2p^3 \ ^2P^\circ$ (17)	2862.26	B	(6n)	39.54	43.85		$4f \ ^2F^\circ-6g \ ^2G$ (26)
472.392 472.232	A A	5 4	16.17 16.17	42.31 42.31	$\frac{1}{2}-1\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$2p^2 \ ^2S-3d \ ^2P^\circ$ (18)							
1751.75 1747.86 1751.24	A A A	10 9 6	18.02 18.01 18.02	25.07 25.07 25.07	$1\frac{1}{2}-2\frac{1}{2}$ $\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$2p^2 \ ^2P-2p^3 \ ^2D^\circ$ (19)	Vac *1908.11	C	7	41.30	47.77	$\{2\frac{1}{2}-3\frac{1}{2}\}$ $\{1\frac{1}{2}-2\frac{1}{2}\}$	$3d \ ^2D^\circ-4f \ ^2F$ (27)
1184.544 1183.030	A A	8 7	18.02 18.01	28.44 28.44	$1\frac{1}{2}-$ $\frac{1}{2}-$	$2p^2 \ ^2P-2p^3 \ ^2P^\circ$ (20)	Air 2453.85 2462.56 2468.36	B B B	(4) (1) (0)	41.51 41.51 41.52	46.53 46.52 46.52	$2\frac{1}{2}-3\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$ $\frac{1}{2}-1\frac{1}{2}$	$3d \ ^4P^\circ-4p \ ^4D^\dagger$ (28)
Air 2713.95 2714.08	B B	4 (3)	28.44 28.44	32.99 32.99	$1\frac{1}{2}-2\frac{1}{2}$ $\frac{1}{2}-1\frac{1}{2}$	$2p^3 \ ^2P^\circ-3d^2 \ D^\dagger$ (21)	Vac *1920.86 1921.49 *1920.86	C C C	8 4 8	41.51 41.51 41.52	47.93 47.94 47.94	$2\frac{1}{2}-3\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$ $\frac{1}{2}-1\frac{1}{2}$	$3d \ ^4P^\circ-4f \ ^4D^\dagger$ (29)
Vac 1805.5 1804.3	A A	7 6	30.33 30.33	37.17 37.17	$1\frac{1}{2}-\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$3p \ ^2P^\circ-4s \ ^2S$ (22)	Air 2063.99 2063.50 2068.25	B B B	(10) (10) (6)	41.96 41.94 41.96	47.93 47.92 47.92	$3\frac{1}{2}-4\frac{1}{2}$ $2\frac{1}{2}-3\frac{1}{2}$ $3\frac{1}{2}-3\frac{1}{2}$	$3d \ ^2F^\circ-4f \ ^2G$ (30)
Air 2247.92 2248.88	B B	(6) (5)	32.99 32.99	38.48 38.48	$2\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-\frac{1}{2}$	$3d \ ^2D-4p \ ^2P^\circ^\dagger$ (23)							

N IV

I P 77.09 Anal B List C Oct. 1947

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N IV

N IV

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac 765. 140	A	17	0. 00	16. 13	0-1	$2s^2\ ^1S - 2p\ ^1P^\circ$ (1)	Vac 335. 050	A	11	16. 13	52. 98	1-2	$2p\ ^1P^\circ - 3d\ ^1D$ (10)
247. 205	A	10	0. 00	49. 98	0-1	$2s^2\ ^1S - 3p\ ^1P^\circ$ (2)	285. 563	A	5	16. 13	59. 36	1-1	$2p\ ^1P^\circ - 3p\ ^1P$ (11)
923. 211	A	12	(8. 31	21. 69)	2-2	$2p\ ^3P^\circ - 2p^2\ ^3P$ (3)	270. 995	A	6	16. 13	61. 69	1-2	$2p\ ^1P^\circ - 3p\ ^1D$ (12)
923. 045	A	10	(8. 30	21. 67)	1-1		345. 063	A	5	(21. 69	57. 46)	2-2	$2p^2\ ^3P - 3s\ ^3P^\circ$ (13)
924. 274	A	10	(8. 31	21. 67)	2-1		345. 107	A	3	(21. 67	57. 44)	1-1	
923. 669	A	10	(8. 30	21. 66)	1-0		303. 123	A	6	(21. 69	62. 41)	2-3	$2p^2\ ^3P - 3d\ ^3D^\circ$ (14)
921. 982	A	10	(8. 30	21. 69)	1-2		303. 048	A	5	(21. 67	62. 41)	1-2	
922. 507	A	10	(8. 29	21. 67)	0-1		303. 009	A	4	(21. 66	62. 40)	0-1	$2p^2\ ^3P - 3d\ ^3P^\circ$ (15)
322. 724	A	9	(8. 31	46. 57)	2-1	$2p\ ^3P^\circ - 3s\ ^3S$ (4)	303. 163	A	4	(21. 69	62. 41)	2-2	
322. 570	A	8	(8. 30	46. 57)	1-1		303. 079	A	4	(21. 67	62. 40)	1-1	
322. 503	A	7	(8. 29	46. 57)	0-1	$2p\ ^3P^\circ - 3d\ ^3D^\dagger$ (5)	297. 815	A	5	(21. 69	63. 14)	2-2	
283. 579	A	12	(8. 31	51. 85)	2-3		*297. 644	A	4b	(21. 67	63. 14)	1-1	$2p^2\ ^1D - 3s\ ^1P^\circ$ (16)
283. 470	A	11	(8. 30	51. 85)	1-2					(21. 67	63. 14)	1-0	
283. 420	A	10	(8. 29	51. 85)	0-1	$2p\ ^3P^\circ - 4d\ ^3D$ (6)	351. 931	A	5	23. 32	58. 40	2-1	$2p^2\ ^1D - 3d\ ^1D^\circ$ (17)
225. 025	A	5	(8. 31	63. 13)	2-3		323. 175	A	7	23. 32	61. 52	2-2	
225. 136	A	4	(8. 30	63. 13)	1-2		315. 053	A	8	23. 82	62. 50	2-3	$2p^2\ ^1D - 3d\ ^1F^\circ$ (18)
225. 098	A	3	(8. 29	63. 13)	0-1	$2p\ ^1P^\circ - 3s\ ^1S$ (9)	Air 2646. 89	B	(8)	(63. 78	68. 44)	4-5	$4f\ ^3F^\circ - 5g\ ^3G$ (19)
1718. 52	A	10	16. 13	23. 32	1-2		2646. 10	B	(7)	(63. 78	68. 44)	3-4	
955. 335	A	10	16. 13	29. 06	1-0		2645. 57	B	(7)	(63. 78	68. 44)	2-3	
387. 353	A	4	16. 13	48. 00	1-0								

N V

I P 97.47 Anal B List C Oct. 1947

REFERENCE

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N V

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac 1238. 800	A	8	0. 00	9. 97	$\frac{1}{2} - 1\frac{1}{2}$	$2s\ ^2S - 2p\ ^2P^\circ$ (1)
1242. 778	A	7	0. 00	9. 93	$\frac{1}{2} - \frac{1}{2}$	
209. 270	A	7	0. 00	58. 99	$\frac{1}{2} - 1\frac{1}{2}$	$2s\ ^2S - 3p\ ^2P^\circ$ (2)
209. 303	A	6	0. 00	58. 98	$\frac{1}{2} - \frac{1}{2}$	
162. 562	A	4	0. 00	75. 94	$\frac{1}{2} -$	$2s\ ^2S - 4p\ ^2P^\circ$ (3)
266. 375	A	7	9. 97	56. 31	$1\frac{1}{2} - \frac{1}{2}$	$2p\ ^2P^\circ - 3s\ ^2S$ (4)
266. 192	A	6	9. 93	56. 31	$\frac{1}{2} - \frac{1}{2}$	
247. 710	A	11	9. 97	59. 80	$1\frac{1}{2} - 2\frac{1}{2}$	$2p\ ^2P^\circ - 3d\ ^2D$ (5)
247. 563	A	10	9. 93	59. 80	$\frac{1}{2} - 1\frac{1}{2}$	
186. 153	A	5	9. 97	76. 28	$1\frac{1}{2} - 2\frac{1}{2}$	$2p\ ^2P^\circ - 4d\ ^2D$ (6)
186. 070	A	4	9. 93	76. 28	$\frac{1}{2} - 1\frac{1}{2}$	

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O I

I P 13.56 Anal A List C Dec. 1947

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O I

O I

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1355. 605	B	8	0. 00	9. 11	2-2	$2p^4\ ^3P-3s\ ^5S^\circ$	1152. 129	A	(5)	1. 96	12. 67	2-2	$2p^4\ ^1D-3s'\ ^1D^\circ$
1358. 524	B	5	0. 02	9. 11	1-2	(1)							(6)
1302. 174†	A	10	0. 00	9. 48	2-1	$2p^4\ ^3P-3s\ ^3S^\circ$	999. 493	A	(2)	1. 96	14. 31	2-1	$2p^4\ ^1D-3s''\ ^1P^\circ$
1304. 858	A	10	0. 02	9. 48	1-1	(2)							(7)
1306. 023	A	10	0. 03	9. 48	0-1		923. 011	B	(-)	1. 96	15. 35	2-3	$2p^4\ ^1D-3d'\ ^1F^\circ$
1039. 226	B	8	0. 00	11. 88	2-1	$2p^4\ ^3P-4s\ ^3S^\circ$							(8)
1040. 932	A	8	0. 02	11. 88	1-1	(3)							
1041. 686	A	7	0. 03	11. 88	0-1		1217. 643	A	(2)	4. 17	14. 31	0-1	$2p^4\ ^1S-3s''\ ^1P^\circ$
1025. 766	B	9	0. 00	12. 03	2-	$2p^4\ ^3P-3d\ ^3D^\circ$							(9)
1027. 421	A	8	0. 02	12. 03	1-	(4)							
1028. 155	B	7	0. 03	12. 03	0-1								
988. 775	C	(8)	0. 00	12. 49	2-3	$2p^4\ ^3P-3s'\ ^3D^\circ\dagger$	Air						
990. 205	A	(8)	0. 02	12. 49	1-2	(5)	2883. 78	D	(3)	10. 94	15. 22	-2	$3p\ ^3P-3d'\ ^3P^\circ$
990. 794	A	(4)	0. 03	12. 49	0-1		2878. 95	D	(2)	10. 94	15. 23	-1	(10)
							2876. 30	D	(1n)	10. 94	15. 23	1-0	

O II

I P 35.00 Anal A List D Dec. 1947

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O II

O II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
834.462†	A	15	0.00	14.79	1½-2½	2p³ ⁴S°-2p⁴ ⁴P	672.948	A	8	5.00	23.34	-1½	2p³ ²P°-3s ²P
833.326	A	15	0.00	14.81	1½-1½	(1)	673.768	A	7	5.00	23.32	-½	(12)
832.754	A	14	0.00	14.82	1½-½		644.148	A	12	5.00	24.16	-½	2p³ ²P°-2p⁴ ²S
539.086	A	8	0.00	22.90	1½-2½	2p³ ⁴S°-3s ⁴P							(13)
539.547	A	8	0.00	22.88	1½-1½	(2)	600.585	A	6	5.00	25.55		2p³ ²P°-3s' ²D
539.853	A	7	0.00	22.87	1½-½								(14)
430.177	A	6	0.00	28.70	1½-2½	2p³ ⁴S°-3d ⁴P	580.967	A	7	5.00	26.24	-1½	2p³ ²P°-2p⁴ ²P
430.041	A	6	0.00	28.71	1½-1½	(3)	580.400	A	6	5.00	26.27	-½	(15)
429.918	A	5	0.00	28.71	1½-½		518.242	A	5	5.00	28.82	-1½	2p³ ²P°-3d ²P
							517.937	A	4	5.00	28.83	-½	(16)
718.484	A	17	3.31	20.49	2½-	2p³ ²D°-2p⁴ ²D	515.498	A	5	5.00	28.94	1½-2½	2p³ ²P°-3d ²D
718.562	A	16	3.31	20.49	1½-	(4)	515.640	A	4	5.00	28.94	-1½	(17)
616.291	A	7	3.31	23.34	2½-1½	2p³ ²D°-3s ²P							
617.051	A	6	3.31	23.32	1½-½	(5)							
616.363	A	4	3.31	23.34	1½-1½		Air						
555.056	A	5	3.31	25.55	2½-	2p³ ²D°-3s' ²D	2445.55	B	10	23.34	28.39	1½-2½	3s ²P-3p' ²D°
555.121	A	5	3.31	25.55	1½-	(6)	2433.56	B	9	23.32	28.39	½-1½	(18)
							2444.26	B	5	23.34	28.39	1½-1½	
538.256	A	10	3.31	26.24	2½-1½	2p³ ²D°-2p⁴ ²P	2300.35	B	8	23.34	28.71	1½-1½	3s ²P-3p' ²P°†
537.830	A	9	3.31	26.27	1½-½	(7)	2293.32	B	6	23.32	28.70	½-½	(19)
538.318	A	7	3.31	26.24	1½-1½								
485.086	A	6	3.31	28.76	2½-3½	2p³ ²D°-3d ²F†							
485.515	A	5	3.31	28.74	1½-2½	(8)	2733.34	B	10	25.18	29.69	½-1½	3p ²S°-4s ²P
483.976	A	5	3.31	28.82	2½-1½	2p³ ²D°-3d ²P†	2747.46	B	6	25.18	29.67	½-½	(20)
483.752	A	4	3.31	28.83	1½-½	(9)							
481.587	A	4	3.31	28.94	2½-2½	2p³ ²D°-3d ²D†	2530.30	B	5	26.14	31.01	2½-3½	3p ²D°-3d' ²F
481.755	A	3	3.31	28.94		(10)	2517.97	B	4	26.11	31.01	1½-2½	(21)
796.661	A	10	5.00	20.49		2p³ ²P°-2p⁴ ²D	2575.300	B	6	26.45	31.24	1½-2½	3p ²P°-3d' ²D†
						(11)	2571.476	B	4	26.44	31.24	½-1½	(22)

O III

I P 54.71 Anal A List C Oct. 1947

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O III

O III

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
835.292	A	16	0.04	14.82	2-3	$2p^2\ ^3P - 2p^3\ ^3D^\circ$							
833.742	A	16	0.01	14.82	1-2, 1	(1)							
835.096	A	14	0.04	14.82	2-2, 1		597.818	A	15	5.33	25.98	0-1	$2p^2\ ^1S - 2p^3\ ^1P^\circ$
832.927	A	14	0.00	14.82	0-1								(13)
703.850	A	18	0.04	17.58	2-2, 1	$2p^2\ ^3P - 2p^3\ ^3P^\circ$	434.975	A	10	5.33	33.71	0-1	$2p^2\ ^1S - 3s\ ^1P^\circ$
702.899	A	17	0.01	17.58	1-2, 1	(2)							(14)
702.822	A	16	0.01	17.58	1-0		345.309	A	10	5.33	41.08	0-1	$2p^2\ ^1S - 3d\ ^1P^\circ$
702.332	A	16	0.00	17.58	0-1								(15)
508.182	A	18	0.04	24.33	2-1	$2p^2\ ^3P - 2p^3\ ^3S^\circ$							
507.683	A	17	0.01	24.33	1-1	(3)							
507.391	A	16	0.00	24.33	0-1								
374.075	A	10	0.04	33.04	2-2	$2p^2\ ^3P - 3s\ ^3P^\circ$	610.746	A	8	14.82	35.03	3-2	$2p^3\ ^3D^\circ - 2p^4\ ^3P$
374.165	A	8	0.01	33.01	1-1	(4)	*610.043	A	7	14.82	35.06	2-1	(16)
374.436	A	8	0.04	33.01	2-1		609.705	A	6	14.82	35.07	1-0	
374.331	A	8	0.01	32.99	1-0		610.850	A	6	14.82	35.03	2-2	
373.805	A	8	0.01	33.04	1-2		*610.043	A	7	14.82	35.06	1-1	
374.005	A	8	0.00	33.01	0-1								
305.769	A	10	0.04	40.41	2-3	$2p^2\ ^3P - 3d\ ^3D^\circ$	898.957	A	8	23.09	36.82	2-2	$2p^3\ ^1D^\circ - 2p^4\ ^1D$
305.656	A	9	0.01	40.40	1-2	(5)							(17)
305.596	A	8	0.00	40.40	0-1								
305.836	A	8	0.04	40.40	2-2								
305.703	A	8	0.01	40.40	1-1		Air						
305.879	A	4	0.04	40.40	2-1		2983.78	B	9	33.71	37.85	1-2	$3s\ ^1P^\circ - 3p\ ^1D$
303.799	A	9	0.04	40.67	2-2	$2p^2\ ^3P - 3d\ ^3P^\circ$							(18)
303.515	A	7	0.01	40.69	1-1	(6)	2454.99	B	8	33.71	38.74	1-0	$3s\ ^1P^\circ - 3p\ ^1S$
303.693	A	7	0.04	40.69	2-1								(19)
303.460	A	7	0.01	40.69	1-0								
303.621	A	7	0.01	40.67	1-2								
303.411	A	7	0.00	40.69	0-1								
599.598	A	18	2.50	23.09	2-2	$2p^2\ ^1D - 2p^3\ ^1D^\circ$	2597.69	B	8	40.67	45.42	2-1	$3d\ ^3P^\circ - 4p\ ^3S^\dagger$
						(7)	2605.41	B	6	40.69	45.42	1-1	(20)
525.795	A	18	2.50	25.98	2-1	$2p^2\ ^1D - 2p^3\ ^1P^\circ$	2558.06	B	8	40.96	45.79	3-2	$3d\ ^1F^\circ - 4p\ ^1D$
						(8)							(21)
395.558	A	12	2.50	33.71	2-1	$2p^2\ ^1D - 3s\ ^1P^\circ$							
						(9)							
328.448	A	10	2.50	40.09	2-2	$2p^2\ ^1D - 3d\ ^1D^\circ$	2686.14	B	10	41.78	46.37	3-2	$3s\ ^3P - 3p\ ^3S^\circ$
						(10)	2674.57	B	8	41.76	46.37	2-2	(22)
							2665.69	B	7	41.74	46.37	1-2	
320.979	A	12	2.50	40.96	2-3	$2p^2\ ^1D - 3d\ ^1F^\circ$							
						(11)							
277.385	A	7	2.50	47.01	2-3	$2p^2\ ^1D - 4d\ ^1F^\circ$	2695.49	B	6	44.85	49.42	1-2	$3p\ ^3S^\circ - 3d\ ^3P$
						(12)	2687.53	B	5	44.85	49.44	1-1	(23)
							2683.65	B	4	44.85	49.44	1-0	

O IV

I P 77.08 Anal A List D Dec. 1947

REFERENCE

A B. Edlén, Nova Acta Reg. Soc. Sci. Uppsala [IV] 9, No. 6, 92 (1934). W L, I, T

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I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
790. 203	A	16	0. 05	15. 67	$1\frac{1}{2}-2\frac{1}{2}$	$2p\ ^2P^\circ-2p^2\ ^2D$ (1)							
787. 710	A	15	0. 00	15. 67	$\frac{1}{2}-1\frac{1}{2}$								
790. 103	A	13	0. 05	15. 67	$1\frac{1}{2}-1\frac{1}{2}$								
609. 829	A	15	0. 05	20. 29	$1\frac{1}{2}-\frac{1}{2}$	$2p\ ^2P^\circ-2p^2\ ^2S$ (2)	625. 852	A	14	8. 83	28. 55	$2\frac{1}{2}-1\frac{1}{2}$	$2p^2\ ^4P-2p^3\ ^4S^\circ$ (6)
608. 395	A	14	0. 00	20. 29	$\frac{1}{2}-\frac{1}{2}$		625. 130	A	14	8. 80	28. 55	$1\frac{1}{2}-1\frac{1}{2}$	
							624. 617	A	13	8. 79	28. 55	$\frac{1}{2}-1\frac{1}{2}$	
554. 514	A	18	0. 05	22. 31	$1\frac{1}{2}-1\frac{1}{2}$	$2p\ ^2P^\circ-2p^2\ ^2P$ (3)	233. 561	A	8	8. 83	61. 68	$2\frac{1}{2}-3\frac{1}{2}$	$2p^2\ ^4P-3d\ ^4D^\circ\ddagger$ (7)
554. 074	A	17	0. 00	22. 28	$\frac{1}{2}-\frac{1}{2}$		233. 495	A	7	8. 80	61. 67	$1\frac{1}{2}-2\frac{1}{2}$	
555. 262	A	16	0. 05	22. 28	$1\frac{1}{2}-\frac{1}{2}$		*233. 457	A	7	8. 79	61. 67	$\frac{1}{2}-$	
553. 328	A	16	0. 00	22. 31	$\frac{1}{2}-1\frac{1}{2}$								
279. 937	A	11	0. 05	44. 15	$1\frac{1}{2}-\frac{1}{2}$	$2p\ ^2P^\circ-3s\ ^2S$ (4)	779. 905	A	10	15. 67	31. 50	$2\frac{1}{2}-2\frac{1}{2}$	$2p^2\ ^2D-2p^3\ ^2D^\circ$ (8)
279. 633	A	10	0. 00	44. 15	$\frac{1}{2}-\frac{1}{2}$		779. 821	A	9	15. 67	31. 50	$1\frac{1}{2}-1\frac{1}{2}$	
238. 573	A	15	0. 05	51. 79	$1\frac{1}{2}-2\frac{1}{2}$	$2p\ ^2P^\circ-3d\ ^2D$ (5)	260. 389	A	10	15. 67	63. 08	$2\frac{1}{2}-3\frac{1}{2}$	$2p^2\ ^2D-3d\ ^2F^\circ$ (9)
238. 361	A	14	0. 00	51. 79	$\frac{1}{2}-1\frac{1}{2}$		260. 556	A	9	15. 67	63. 05	$1\frac{1}{2}-2\frac{1}{2}$	

O V

I P 113.38 Anal A List D Dec. 1947

REFERENCE

A B. Edlén, Nova Acta Reg. Soc. Sci. Uppsala [IV] 9, No. 6, 65 (1934). W L, I, T

O V

O V

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac 629. 732	A	15	0. 00	19. 60	0-1	$2s^2 \ ^1S - 2p \ ^1P^\circ$ (1)	Vac 774. 522	A	7	19. 60	35. 54	1-0	$2p \ ^1P^\circ - 2p^2 \ ^1S$ (8)
172. 168	A	12	0. 00	71. 70	0-1	$2s^2 \ ^1S - 3p \ ^1P^\circ$ (2)	248. 459	A	6	19. 60	69. 29	1-0	$2p \ ^1P^\circ - 3s \ ^1S$ (9)
760. 445	A	12	(10. 19	26. 43)	2-2	$2p \ ^3P^\circ - 2p^2 \ ^3P$ (3)	220. 352	A	13	19. 60	75. 63	1-2	$2p \ ^1P^\circ - 3d \ ^1D$ (10)
760. 229	A	10	(10. 15	26. 39)	1-1		194. 593	A	8	19. 60	83. 04	1-1	$2p \ ^1P^\circ - 3p \ ^1P$ (11)
762. 001	A	10	(10. 19	26. 39)	2-1		185. 747	A	9	19. 60	86. 07	1-2	$2p \ ^1P^\circ - 3p \ ^1D$ (12)
761. 130	A	10	(10. 15	26. 37)	1-0	$2p \ ^3P^\circ - 3s \ ^3S$ (4)	203. 890	A	8	(26. 43	86. 97)	2-3	$2p^2 \ ^3P - 3d \ ^3D^\circ$ (13)
758. 677	A	10	(10. 15	26. 43)	1-2		203. 821	A	7	(26. 39	86. 96)	1-2	
759. 440	A	10	(10. 14	26. 39)	0-1		203. 783	A	6	(26. 37	86. 95)	0-1	
215. 245	A	9	(10. 19	67. 55)	2-1	$2p \ ^3P^\circ - 3d \ ^3D$ (5)	202. 393	A	7	(26. 43	87. 42)	2-2	$2p^2 \ ^3P - 3d \ ^3P^\circ$ (14)
215. 104	A	8	(10. 15	67. 55)	1-1		202. 226	A	5	(26. 39	87. 44)	1-1	
215. 034	A	7	(10. 14	67. 55)	0-1		202. 335	A	5	(26. 43	87. 44)	2-1	
192. 906	A	14	(10. 19	74. 19)	2-3	$2p \ ^3P^\circ - 3p \ ^3D$ (6)	202. 282	A	5	(26. 39	87. 42)	1-2	
192. 800	A	13	(10. 15	74. 19)	1-2		216. 018	A	8	28. 61	85. 75	2-2	$2p^2 \ ^1D - 3d \ ^1D^\circ$ (15)
192. 751	A	12	(10. 14	74. 18)	0-1		207. 794	A	10	28. 61	88. 02	2-3	$2p^2 \ ^1D - 3d \ ^1F^\circ$ (16)
*167. 991	A	8	(10. 19	83. 68)	$\begin{cases} 2-3 \\ 1-2 \\ 0-1 \end{cases}$								
168. 077	A	4	(10. 19	83. 64)	2-2								
168. 042	A	4	(10. 15	83. 62)	1-1								
1371. 287	A	10	19. 60	28. 61	1-2	$2p \ ^1P^\circ - 2p^2 \ ^1D$ (7)							

O VI

I P 137.52 Anal B List D Dec. 1947

REFERENCE

A B. Edlén, Nova Acta Reg. Soc. Sci. Uppsala [IV] 9, No. 6, 45 (1934). W L, I, T

O VI

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac 1031. 912	A	10	0. 00	11. 96	$\frac{1}{2} - 1\frac{1}{2}$	$2s \ ^2S - 2p \ ^2P^\circ$ (1)
1037. 613	A	9	0. 00	11. 90	$\frac{1}{2} - \frac{1}{2}$	
150. 088	A	10	0. 00	82. 25	$\frac{1}{2} - 1\frac{1}{2}$	$2s \ ^2S - 3p \ ^2P^\circ$ (2)
150. 124	A	9	0. 00	82. 23	$\frac{1}{2} - \frac{1}{2}$	
184. 117	A	9	11. 96	79. 01	$1\frac{1}{2} - \frac{1}{2}$	$2p \ ^2P^\circ - 3s \ ^2S$ (3)
183. 937	A	8	11. 90	79. 01	$\frac{1}{2} - \frac{1}{2}$	
173. 082	A	13	11. 96	83. 29	$1\frac{1}{2} - 2\frac{1}{2}$	$2p \ ^2P^\circ - 3d \ ^2D$ (4)
172. 935	A	12	11. 90	83. 28	$\frac{1}{2} - 1\frac{1}{2}$	
129. 872	A	6	11. 96	107. 02	$1\frac{1}{2} - 2\frac{1}{2}$	$2p \ ^2P^\circ - 4d \ ^2D$ (5)
129. 786	A	5	11. 90	107. 02	$\frac{1}{2} - 1\frac{1}{2}$	

FLUORINE

F I

I P 17.35 Anal B List D Dec. 1947

REFERENCE

A K. Lidén, Ark. Fysik (Stockholm) **I**, No. 9, 251 (1949). W L, I, T

F I

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac						
954. 825†	A	1000	0. 00	12. 93	$1\frac{1}{2}-1\frac{1}{2}$	$2p^5\ ^2P^\circ-3s\ ^2P$ (1)
955. 545	A	750	0. 05	12. 97	$\frac{1}{2}-\frac{1}{2}$	
951. 871	A	500	0. 00	12. 97	$1\frac{1}{2}-\frac{1}{2}$	
958. 524	A	500	0. 05	12. 93	$\frac{1}{2}-1\frac{1}{2}$	
806. 964	A	150	0. 00	15. 30	$1\frac{1}{2}-2\frac{1}{2}$	$2p^5\ ^2P^\circ-3s'\ ^2D$ (2)
809. 599	A	125	0. 05	15. 30	$\frac{1}{2}-1\frac{1}{2}$	

F II

I P 34.84 Anal B List D Dec. 1947

REFERENCES

A I. S. Bowen, Phys. Rev. **45**, 82 (1934). W L, I, T
 B. Edlén, Zeit. Phys. **93**, 433 (1935). T
 H. Dingle, Proc. Roy. Soc. London [A] **128**, 600 (1930). T

F II

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac						
606. 81†	A	9	0. 00	20. 34	2-2	$2p^4\ ^3P-2p^5\ ^3P^\circ$ (1)
606. 95	A	4	0. 04	20. 38	1-1	
605. 67	A	8	0. 00	20. 38	2-1	
606. 27	A	7	0. 04	20. 40	1-0	
608. 06	A	8	0. 04	20. 34	1-2	
607. 48	A	7	0. 06	20. 38	0-1	
546. 846	A	6	0. 00	22. 57	2-1	$2p^4\ ^3P-3s\ ^3S^\circ$ (2)
547. 873	A	4	0. 04	22. 57	1-1	
548. 324	A	3	0. 06	22. 57	0-1	
471. 990	A	6	0. 00	26. 15	2-3	$2p^4\ ^3P-3s'\ ^3D^\circ$ (3)
472. 710	A	5	0. 04	26. 16	1-2	
473. 021	A	3	0. 06	26. 16	0-1	

Ne II

I P 40.91 Anal A List C Nov. 1948

REFERENCES

- A J. C. Boyce, Phys. Rev. **46**, 378 (1934). W L, I, T
 B T. L. de Bruin und C. J. Bakker, Zeit. Phys. **69**, 19 (1931). W L, I, T

Ne II

Ne II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
460. 725†	A	15	0. 00	26. 79	$1\frac{1}{2}-\frac{1}{2}$	$2p^5\ ^2P^\circ-2p^6\ ^2S$	1688. 38	A	4	26. 79	34. 11	$\frac{1}{2}-1\frac{1}{2}$	$2p^6\ ^2S-3p'\ ^2P^\circ$
462. 388	A	14	0. 10	26. 79	$\frac{1}{2}-\frac{1}{2}$	(1)	1681. 70	A	3	26. 79	34. 14	$\frac{1}{2}-\frac{1}{2}$	(7)
456. 344	A	4	0. 00	27. 05	$1\frac{1}{2}-2\frac{1}{2}$	$2p^5\ ^2P^\circ-3s\ ^4P$							
456. 895	A	5	0. 10	27. 12	$\frac{1}{2}-1\frac{1}{2}$	(2)							
455. 270	A	7	0. 00	27. 12	$1\frac{1}{2}-1\frac{1}{2}$		Air						
454. 648	A	5	0. 10	27. 15	$1\frac{1}{2}-\frac{1}{2}$		2955. 73	B	7	27. 05	31. 23	$2\frac{1}{2}-1\frac{1}{2}$	$3s\ ^4P-3p\ ^4S^\circ$
							3011. 65	B	6	27. 12	31. 23	$1\frac{1}{2}-1\frac{1}{2}$	(8)
446. 252	A	8	0. 00	27. 66	$1\frac{1}{2}-1\frac{1}{2}$	$2p^5\ ^2P^\circ-3s\ ^2P$							
446. 591	A	7	0. 10	27. 74	$\frac{1}{2}-\frac{1}{2}$	(3)							
445. 032	A	7	0. 00	27. 74	$1\frac{1}{2}-\frac{1}{2}$		Vac						
447. 813	A	8	0. 10	27. 66	$\frac{1}{2}-1\frac{1}{2}$		1916. 16	B	10	27. 66	34. 11	$1\frac{1}{2}-1\frac{1}{2}$	$3s\ ^2P-3p'\ ^2P^\circ$
405. 852	A	9	0. 00	30. 42	$1\frac{1}{2}-$	$2p^5\ ^2P^\circ-3s'\ ^2D$	1930. 11	B	8	27. 74	34. 14	$\frac{1}{2}-\frac{1}{2}$	(9)
407. 136	A	8	0. 10	30. 42	$\frac{1}{2}-1\frac{1}{2}$	(4)	1907. 56	B	8	27. 66	34. 14	$1\frac{1}{2}-\frac{1}{2}$	
							1938. 92	B	8	27. 74	34. 11	$\frac{1}{2}-1\frac{1}{2}$	
361. 427	A	5	0. 00	34. 16	$1\frac{1}{2}-\frac{1}{2}$	$2p^5\ ^2P^\circ-3s''\ ^2S$							
362. 456	A	4	0. 10	34. 16	$\frac{1}{2}-\frac{1}{2}$	(5)							
356. 795	A	5d	0. 00	34. 60	$1\frac{1}{2}-2\frac{1}{2}$	$2p^5\ ^2P^\circ-3d\ ^2D$	Air						
357. 534	A	5	0. 10	34. 62	$\frac{1}{2}-1\frac{1}{2}$	(6)	2792. 05	B	5	30. 39	34. 81	$2\frac{1}{2}-2\frac{1}{2}$	$3p\ ^4P^\circ-4s\ ^4P^\dagger$
356. 534	A	3	0. 00	34. 62	$1\frac{1}{2}-1\frac{1}{2}$		2780. 06	B	2	30. 42	34. 86	$1\frac{1}{2}-1\frac{1}{2}$	(10)
							2770. 06	B	1	30. 44	34. 90	$\frac{1}{2}-\frac{1}{2}$	

Ne III

I P 63.5 Anal C List C Sept. 1948

REFERENCES

- A J. C. Boyce, Phys. Rev. **46**, 378 (1934). W L, I, T
 B V. v. Keussler, Zeit. Phys. **85**, 1 (1933). W L, I
 C T. L. de Bruin, Zeit. Phys. **77**, 505 (1932). W L, I, T

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I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
489.501	A	10	0.00	25.22	2-2	$2p^4\ ^3P - 2p^5\ ^3P^\circ$ (1)	301.124	A	4	3.19	44.19	2-2	$2p^4\ ^1D - 3s'\ ^1D^\circ$ (7)
489.641	A	4	0.08	25.29	1-1								
488.103	A	8	0.00	25.29	2-1		282.50	A	0	3.19	46.89	2-1	$2p^4\ ^1D - 3s''\ ^1P^\circ$ (8)
488.868	A	7	0.08	25.33	1-0								
491.050	A	9	0.08	25.22	1-2								
490.310	A	7	0.11	25.29	0-1								
313.048	A	4	0.00	39.44	2-1	$2p^4\ ^3P - 3s\ ^3S^\circ$ (2)	427.840	A	3	6.88	35.74	0-1	$2p^4\ ^1S - 2p^5\ ^1P^\circ$ (9)
313.677	A	3	0.08	39.44	1-1								
313.92	A	1	0.11	39.44	0-1		308.559	A	1	6.88	46.89	0-1	$2p^4\ ^1S - 3s''\ ^1P^\circ$ (10)
283.206	B	6	0.00	43.60	2-3	$2p^4\ ^3P - 3s'\ ^3D^\circ$ (3)							
*283.690	B	3u	0.08	43.60	1-2								
283.894	B	3	0.11	43.60	0-1		Air						
*283.178	B	3u	0.00	43.60	2-2		2590.04	C	40	(38.78)	43.55)	2-3	$3s\ ^5S^\circ - 3p\ ^5P$ (11)
*283.690	B	3u	0.08	43.60	1-1		2593.60	C	30	(38.78)	43.54)	2-2	
*283.178	B	3u	0.00	43.60	2-1		2595.68	C	20	(38.78)	43.54)	2-1	
267.059	B	3u	0.00	46.22	2-2, 1	$2p^4\ ^3P - 3s''\ ^3P^\circ$ (4)							
267.516	B	3u	0.08	46.23	1-								
267.709	B	2	0.11	46.23	0-1		2677.90	C	30	39.44	44.04	1-2, 0	$3s\ ^3S^\circ - 3p\ ^3P$ (12)
251.145	B	2u	0.00	49.16	2-	$2p^4\ ^3P - 3d\ ^3D^\circ$ (5)	2678.64	C	25	39.44	44.04	1-1	
251.558	B	2	0.08	49.16	1-2, 1								
251.726	B	2	0.11	49.16	0-1		Vac						
							1257.190	A	6	39.44	49.25	1-2	$3s\ ^3S^\circ - 3p'\ ^3P$ (13)
							1255.685	A	5	39.44	49.27	1-1	
							1255.026	A	2	39.44	49.27	1-0	
379.308	A	7	3.19	35.74	2-1	$2p^4\ ^1D - 2p^5\ ^1P^\circ$ (6)							

Ne IV

I P 96.77 Anal B List C Sept. 1948

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A J. C. Boyce, Phys. Rev. **46**, 381 (1934). W L, TB F. W. Paul and H. D. Polster, Phys. Rev. **59**, 424 (1941). W L, I, T

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I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
543. 884	A	150	0. 00	22. 70	$1\frac{1}{2}-2\frac{1}{2}$	$2p^3\ ^4S^\circ-2p^4\ ^4P$	212. 556	B	150	(5. 06	63. 13)		$2p^3\ ^2D^\circ-3s'\ ^2D$
542. 076	A	100	0. 00	22. 77	$1\frac{1}{2}-1\frac{1}{2}$	(1)							(6)
541. 124	A	80	0. 00	22. 81	$1\frac{1}{2}-\frac{1}{2}$		186. 575	B	150	(5. 06	71. 22)		$2p^3\ ^2D^\circ-3d''\ ^2D$
208. 485	B	100	0. 00	59. 21	$1\frac{1}{2}-2\frac{1}{2}$	$2p^3\ ^4S^\circ-3s\ ^4P$							(7)
208. 734	B	100	0. 00	59. 14	$1\frac{1}{2}-1\frac{1}{2}$	(2)							
208. 899	B	80	0. 00	59. 10	$1\frac{1}{2}-\frac{1}{2}$		521. 810	A	25	(7. 67	31. 33)	$1\frac{1}{2}-2\frac{1}{2}$	$2p^3\ ^2P^\circ-2p^4\ ^2D$
172. 620	B	80	0. 00	71. 52	$1\frac{1}{2}-2\frac{1}{2}$	$2p^3\ ^4S^\circ-3d\ ^4P$	521. 730	A	25	(7. 67	31. 33)	$\frac{1}{2}-1\frac{1}{2}$	(8)
172. 525	B	50	0. 00	71. 55	$1\frac{1}{2}-1\frac{1}{2}$	(3)							
172. 492	B	40	0. 00	71. 57	$1\frac{1}{2}-\frac{1}{2}$		421. 584	A	150	(7. 67	36. 95)	$-\frac{1}{2}$	$2p^3\ ^2P^\circ-2p^4\ ^2S$
													(9)
*469. 817	A	200	(5. 06	31. 33)	$\{2\frac{1}{2}-2\frac{1}{2}$	$2p^3\ ^2D^\circ-2p^4\ ^2D$	388. 23	A	100	(7. 67	39. 47)	$-1\frac{1}{2}$	$2p^3\ ^2P^\circ-2p^4\ ^2P$
469. 865	A	200	(5. 06	31. 33)	$\{1\frac{1}{2}-1\frac{1}{2}$	(4)	387. 13	A	125	(7. 67	39. 56)	$-\frac{1}{2}$	(10)
					$1\frac{1}{2}-2\frac{1}{2}$		194. 276	B	100	(7. 67	71. 22)		$2p^3\ ^2P^\circ-3d''\ ^2D$
358. 70	A	200w	(5. 06	39. 47)	$-\frac{1}{2}$	$2p^3\ ^2D^\circ-2p^4\ ^2P$							(11)
357. 831	B	50	(5. 06	39. 56)	$1\frac{1}{2}-\frac{1}{2}$	(5)							

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I P 125.9 Anal B List C Sept. 1948

REFERENCE

A F. W. Paul and H. D. Polster, Phys. Rev. **59**, 424 (1941). W L, I, T

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I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
572. 336	A	80	0. 14	21. 71	2-3	$2p^2\ ^3P-2p^3\ ^3D^\circ$	*359. 385§§§	A	50	0. 14	34. 49	2-1	$2p^2\ ^3P-2p^3\ ^3S^\circ$
569. 830	A	50	0. 05	21. 72	1-2	(1)	*358. 472§§	A	50	0. 05	34. 49	1-1	(3)
568. 418	A	40	0. 00	21. 72	0-1		357. 955	A	40	0. 00	34. 49	0-1	
572. 106	A	25	0. 14	21. 72	2-2								
569. 759	A	25	0. 05	21. 72	1-1		416. 198	A	80	(3. 74	33. 40)	2-2	$2p^2\ ^1D-2p^3\ ^1D^\circ$
*482. 987	A	50	0. 14	25. 70	2-2	$2p^2\ ^3P-2p^3\ ^3P^\circ$							(4)
*481. 361	A	25	0. 05	25. 70	1-1	(2)	365. 594	A	100	(3. 74	37. 51)	2-1	$2p^2\ ^1D-2p^3\ ^1P^\circ$
*482. 987	A	50	0. 14	25. 70	2-1								(5)
481. 281	A	15	0. 05	25. 70	1-0		173. 932	A	50	(3. 74	74. 72)	2-1	$2p^2\ ^1D-3s\ ^1P^\circ$
*481. 361	A	25	0. 05	25. 70	1-2								(6)
480. 406	A	25	0. 00	25. 70	0-1								

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I P 5.12 Anal A List C July 1947

REFERENCE

- A A. Fowler, *Report on Series in Line Spectra* p. 99 (Fleetway Press, London, 1922). W L, I T
 H. Kayer, *Tabelle der Hauptlinien der Linienspektren aller Elemente*, 2d Edition by
 R. Ritschl, p. 193 (Julius Springer, Berlin, 1939). (I)

Na I

Na I

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air							Air						
2852. 828	A	6R	0. 00	4. 33	$\frac{1}{2}-1\frac{1}{2}$	$3s^2S-5p^2P^o$	2543. 817	A	-----	0. 00	4. 85	$\frac{1}{2}-1\frac{1}{2}$	$3s^2S-8p^2P^o$
2853. 031	A	5R	0. 00	4. 33	$\frac{1}{2}-\frac{1}{2}$	(1)	2543. 875	A	-----	0. 00	4. 85	$\frac{1}{2}-\frac{1}{2}$	(4)
2680. 335	A	5R	0. 00	4. 60	$\frac{1}{2}-1\frac{1}{2}$	$3s^2S-6p^2P^o$	2512. 128	A	-----	0. 00	4. 91	$\frac{1}{2}-1\frac{1}{2}$	$3s^2S-9p^2P^o$
2680. 443	A	4R	0. 00	4. 60	$\frac{1}{2}-\frac{1}{2}$	(2)	2512. 210	A	-----	0. 00	4. 91	$\frac{1}{2}-\frac{1}{2}$	(5)
2593. 828	A	(3R)	0. 00	4. 76	$\frac{1}{2}-1\frac{1}{2}$	$3s^2S-7p^2P^o$	2490. 733	A	-----	0. 00	4. 95	$\frac{1}{2}-$	$3s^2S-10p^2P^o$
2593. 927	A	(2R)	0. 00	4. 76	$\frac{1}{2}-\frac{1}{2}$	(3)							(6)

Na II

I P 47.10 Anal B List C June 1947

REFERENCES

- A J. Söderqvist, *Nova Acta Reg. Soc. Sci. Uppsala* [IV] 9, No. 7, p. 26 (1934). W L, I, T
 B S. Frisch, *Zeit. Phys.* 70, 498 (1931). W L, I, T

Na II

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I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Air						
376. 375	A	3	0. 00	32. 80	0-1	$2p^6\ ^1S-3s\ [1\frac{1}{2}]^o$	2974. 991	B	6	32. 87	37. 02	0-1	$3s'\ [\frac{1}{2}]^o-3p'[1\frac{1}{2}]$
						(1)							(9)
372. 069†	A	6	0. 00	33. 18	0-1	$2p^6\ ^1S-3s'\ [\frac{1}{2}]^o$	2671. 829	B	6	36. 20	40. 82	1-1	$3p\ [\frac{1}{2}]-3d\ [\frac{1}{2}]^o$
						(2)							(10)
301. 432	A	1	0. 00	40. 95	0-1	$2p^6\ ^1S-3d\ [1\frac{1}{2}]^o$	2660. 996	B	7	36. 20	40. 84	1-2	$3p\ [\frac{1}{2}]-3d\ [1\frac{1}{2}]^o$
						(3)							(11)
300. 151	A	1	0. 00	41. 13	0-1	$2p^6\ ^1S-3d'[1\frac{1}{2}]^o$	2611. 815	B	7	36. 20	40. 92	1-2	$3p\ [\frac{1}{2}]-4s\ [1\frac{1}{2}]^o$
						(4)							(12)
Air							2531. 548	B	6	36. 20	41. 07	1-0	$3p\ [\frac{1}{2}]-4s'\ [\frac{1}{2}]^o$
2917. 516	B	5	32. 71	36. 94	2-2	$3s\ [1\frac{1}{2}]^o-3p\ [1\frac{1}{2}]$							(13)
*2984. 183	B	7	32. 80	36. 94	1-2	(5)							
2859. 481	B	5	32. 71	37. 02	2-1	$3s\ [1\frac{1}{2}]^o-3p'[1\frac{1}{2}]$	2951. 231	B	8	36. 70	40. 88	3-4	$3p\ [2\frac{1}{2}]-3d\ [3\frac{1}{2}]^o$
						(6)							(14)
2841. 721	B	7	32. 71	37. 05	2-2	$3s\ [1\frac{1}{2}]^o-3p'[1\frac{1}{2}]$	*2984. 183	B	7	36. 81	40. 94	1-2	$3p\ [1\frac{1}{2}]-3d\ [2\frac{1}{2}]^o$
2904. 914	B	7	32. 80	37. 05	1-2	(7)							(15)
2881. 140	B	6	32. 80	37. 08	1-0	$3s\ [\frac{1}{2}]^o-3p\ [1\frac{1}{2}]$	2893. 946	B	6	36. 81	41. 07	1-0	$3p\ [1\frac{1}{2}]-4s'\ [\frac{1}{2}]^o$
						(8)							(16)

MAGNESIUM

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I P 7.61 Anal A List C July 1947

REFERENCES

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I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air 2852. 120†	A	300R	0. 00	4. 33	0-1	3s ² 1S - 3p 1P° (1)	Air 2736. 559 2733. 509 2732. 009	A A A	10n 5n	2. 70 2. 70 2. 70	7. 21 7. 21 7. 21	2-3 1- 0-	3p 3P° - 6d 3D (9)
2025. 82	A	(15n)	0. 00	6. 09	0-1	3s ² 1S - 4p 1P° (2)	2698. 16 2695. 19 2693. 74	A A A	5 4 3	2. 70 2. 70 2. 70	7. 28 7. 28 7. 28	2-1 1-1 0-1	3p 3P° - 8s 3S (10)
2941. 990	A	8	2. 70	6. 90	2-1	3p 3P° - 6s 3S (3)	2672. 56 2669. 63 2668. 23	A A A	6 5 4	2. 70 2. 70 2. 70	7. 32 7. 32 7. 32	2-3 1- 0-	3p 3P° - 7d 3D (11)
2938. 469	A	4	2. 70	6. 90	1-1		2649. 12 2646. 26 2644. 87	A A A	4 3 2	2. 70 2. 70 2. 70	7. 36 7. 36 7. 36	2-1 1-1 0-1	3p 3P° - 9s 3S (12)
2936. 735	A	2	2. 70	6. 90	0-1		2632. 94 2630. 10 2628. 72	A A A	5 4 4	2. 70 2. 70 2. 70	7. 39 7. 39 7. 39	2-3 1- 0-	3p 3P° - 8d 3D (13)
2906. 35	A	(5)	2. 70	6. 95	2-2	3p 3P° - 5d 1D (4)	2617. 56 2614. 74 2613. 37	A A A	3 2	2. 70 2. 70 2. 70	7. 42 7. 42 7. 42	2-1 1-1 0-1	3p 3P° - 10s 3S (14)
2902. 90	A	(3)	2. 70	6. 95	1-2								
2851. 647	A	8	2. 70	7. 03	2-3	3p 3P° - 5d 3D (5)							
2848. 338	A	7	2. 70	7. 03	1-								
2846. 711	A	6	2. 70	7. 03	0-								
*2779. 832	A	12	2. 70 2. 70	7. 14 7. 14	2-2 1-1	3p 3P° - 3p ² 3P (6)							
2782. 974	A	10	2. 70	7. 14	2-1								
*2781. 418	A	10	2. 70	7. 14	1-0								
*2776. 695	A	10	2. 70	7. 14	1-2								
*2778. 277	A	10	2. 70	7. 14	0-1								
*2781. 418	A	10	2. 70	7. 14	2-1	3p 3P° - 7s 3S (7)	2915. 447	A	(7)	5. 73	9. 96	2-3	3s 1D - 3d 1F° (15)
*2778. 277	A	10	2. 70	7. 14	1-1								
*2776. 695	A	10	2. 70	7. 14	0-1								
2768. 346	A	(8)	2. 70	7. 16	2-2	3p 3P° - 6d 1D (8)							
2765. 220	A	(6)	2. 70	7. 16	1-2								

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I P 14.97 Anal A List C May 1947

REFERENCE

A A. Fowler, *Report on Series in Line Spectra*, p. 118 (Fleetway Press, London, 1922). W L, I, T

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I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air 2795. 523† 2802. 698	A A	50 50	0. 00 0. 00	4. 41 4. 40	$\frac{1}{2}-\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$3s\ ^2S - 3p\ ^2P^\circ$ (1)	Air 2660. 821 2660. 755	A A	10	{8. 83 8. 83	13. 46 13. 46	$2\frac{1}{2}-$ $1\frac{1}{2}-$	$3d\ ^2D - 6f\ ^2F^\circ$ (4)
							2449. 573	A		8. 83	13. 86		$3d\ ^2D - 7f\ ^2F^\circ$ (5)
2936. 496 2928. 625	A A	35 35	4. 41 4. 40	8. 62 8. 62	$1\frac{1}{2}-\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$3p\ ^2P^\circ - 4s\ ^2S$ (2)							
2797. 989 2790. 768	A A	40 40	4. 41 4. 40	8. 83 8. 83	$1\frac{1}{2}-2\frac{1}{2}$ $\frac{1}{2}-1\frac{1}{2}$	$3p\ ^2P^\circ - 3d\ ^2D$ (3)	2971. 70 2969. 02	A A	1 0	9. 96 9. 95	14. 11 14. 11	$1\frac{1}{2}-\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$4p\ ^2P^\circ - 9s\ ^2S$ (6)
							2967. 87 2965. 19	A A	1 0	9. 96 9. 95	14. 11 14. 11	$1\frac{1}{2}-\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$4p\ ^2P^\circ - 8d\ ^2D$ (7)

Mg III

I P 79.79 Anal B List D July 1947

REFERENCE

A J. Söderqvist, *Nova Acta Reg. Soc. Sci. Uppsala* [IV] 9, No. 7, 27 (1934). W L, I, T

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I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac 234. 258	A	12	0. 00	52. 70	0-1	$2p^6\ ^1S - 3s\ [1\frac{1}{2}]^\circ$ (1)	Air 2396. 04 2468. 50	A A	3d 3	52. 55 52. 70	57. 70 57. 70	2-1 1-1	$3s\ [1\frac{1}{2}]^\circ - 3p\ [1\frac{1}{2}]$ (5)
231. 730	A	14	0. 00	53. 27	0-1	$2p^6\ ^1S - 3s'\ [1\frac{1}{2}]^\circ$ (2)	2065. 54 2092. 64 2040. 23	A A A	5d 4d 3d	52. 55 52. 70 52. 55	58. 52 58. 60 58. 60	2-3 1-2 2-2	$3s\ [1\frac{1}{2}]^\circ - 3p\ [2\frac{1}{2}]$ (6)
187. 194	A	8	0. 00	65. 95	0-1	$2p^6\ ^1S - 3d\ [1\frac{1}{2}]^\circ$ (3)							
186. 510	A	9	0. 00	66. 19	0-1	$2p^6\ ^1S - 3d'\ [1\frac{1}{2}]^\circ$ (4)	2529. 97	A	2	52. 82	57. 70	0-1	$3s'\ [1\frac{1}{2}]^\circ - 3p\ [1\frac{1}{2}]$ (7)

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I P 5.96 Anal A List C Aug. 1947

REFERENCES

- A A. Fowler, *Report on Series in Line Spectra*, p. 156
(Fleetway Press, London, 1922). W L, I, T
B F. Paschen, *Ann. der Phys.* [5] **12**, 522 (1932). W L, I, T

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I A	Ref	Int	E P		J	Multiplet (No.)	I A	Ref	Int	E P		J	Multiplet (No.)
			Low	High						Low	High		
Air							Air						
2660.393	A	10R	0.01	4.65	$1\frac{1}{2}-\frac{1}{2}$	$3p\ ^2P^\circ-5s\ ^2S$	2174.028	A	1R	0.01	5.69	$1\frac{1}{2}-2\frac{1}{2}$	$3p\ ^2P^\circ-8d\ ^2D$
2652.484	A	10R	0.00	4.65	$\frac{1}{2}-\frac{1}{2}$	(1)	2168.805	A	1R	0.00	5.69	$\frac{1}{2}-1\frac{1}{2}$	(9)
2575.113	A	10R	0.01	4.81	$1\frac{1}{2}-2\frac{1}{2}$	$3p\ ^2P^\circ-4d\ ^2D$							
2567.997	A	10R	0.00	4.81	$\frac{1}{2}-1\frac{1}{2}$	(2)	2180.96	B	8	3.13	8.79	$\frac{1}{2}-1\frac{1}{2}?$	$4s\ ^2S-3d\ ^2P^\circ$
2575.411	A	3R	0.01	4.81	$1\frac{1}{2}-1\frac{1}{2}$		2177.35	B	6	3.13	8.80	$\frac{1}{2}-\frac{1}{2}?$	(10)
2378.408	A	3	0.01	5.20	$1\frac{1}{2}-\frac{1}{2}$	$3p\ ^2P^\circ-6s\ ^2S$							
2372.084	A	3	0.00	5.20	$\frac{1}{2}-\frac{1}{2}$	(3)	2372.115	B	10	3.60	8.80	$2\frac{1}{2}-3\frac{1}{2}$	$3p^2\ ^4P-3d\ ^4D^\circ$
2373.132	A	8R	0.01	5.21	$1\frac{1}{2}-2\frac{1}{2}$	$3p\ ^2P^\circ-5d\ ^2D$	2369.289	B	8	3.59	8.80	$1\frac{1}{2}-2\frac{1}{2}$	(11)
2367.064	A	8R	0.01	5.21	$\frac{1}{2}-1\frac{1}{2}$	(4)	2367.596	B	5	3.58	8.80	$\frac{1}{2}-1\frac{1}{2}$	
2373.360	A	2R	0.01	5.21	$1\frac{1}{2}-1\frac{1}{2}$		2373.549	B	6	3.60	8.80	$2\frac{1}{2}-2\frac{1}{2}$	
2269.093	A	4R	0.01	5.45	$1\frac{1}{2}-2\frac{1}{2}$	$3p\ ^2P^\circ-6d\ ^2D$	2370.208	B	6	3.59	8.80	$1\frac{1}{2}-1\frac{1}{2}$	
2263.453	A	4R	0.00	5.45	$\frac{1}{2}-1\frac{1}{2}$	(5)	2368.090	B	5	3.58	8.79	$\frac{1}{2}-\frac{1}{2}$	
2269.212	A	2R	0.01	5.45	$1\frac{1}{2}-1\frac{1}{2}$		2321.570	B	8	3.60	8.91	$2\frac{1}{2}-2\frac{1}{2}$	$3p^2\ ^4P-3d\ ^4P^\circ$
2263.731	A	2	0.01	5.47	$1\frac{1}{2}-\frac{1}{2}$	$3p\ ^2P^\circ-7s\ ^2S$	2314.992	B	1	3.59	8.92	$1\frac{1}{2}-1\frac{1}{2}$	(12)
2257.999	A	2	0.00	5.47	$\frac{1}{2}-\frac{1}{2}$	(6)	2311.031	B	1	3.58	8.92	$\frac{1}{2}-\frac{1}{2}$	
2210.046	A	2R	0.01	5.60	$1\frac{1}{2}-2\frac{1}{2}$	$3p\ ^2P^\circ-7d\ ^2D$	2319.069	B	4	3.60	8.92	$2\frac{1}{2}-1\frac{1}{2}$	
*2204.627	A	2R	0.00	5.60	$\frac{1}{2}-1\frac{1}{2}$	(7)	2313.527	B	4	3.59	8.92	$1\frac{1}{2}-\frac{1}{2}$	
							2317.487	B	5	3.59	8.91	$1\frac{1}{2}-2\frac{1}{2}$	
*2204.627	A	2R	0.01	5.61	$1\frac{1}{2}-\frac{1}{2}$	$3p\ ^2P^\circ-8s\ ^2S$	2312.491	B	2	3.58	8.92	$\frac{1}{2}-1\frac{1}{2}$	
2199.64	A	1	0.00	5.61	$\frac{1}{2}-\frac{1}{2}$	(8)	2837.95	B	12	4.00	8.35	$2\frac{1}{2}-2\frac{1}{2}$	$3d\ ^2D-3d\ ^2D^\circ$
							2840.11	B	10	4.00	8.35	$1\frac{1}{2}-1\frac{1}{2}$	(13)

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I P 18.75 Anal A List C July 1947

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- A R. A. Sawyer and F. Paschen, *Ann. der Phys.* [4] **84**, 1 (1927). W L, I, T
B F. Paschen and R. Ritschl, *Ann. der Phys.* [5] **18**, 885 (1933). W L, T
C R. V. Zumstein, *Phys. Rev.* **38**, 2214 (1931). W L

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I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air 2669. 166	A	10	0. 00	4. 62	0-1	$3s^2 \ ^1S - 3p \ ^3P^o$ (1)	Vac 1625. 60	A	3	7. 39	14. 98	1-0	$3p \ ^1P^o - 5s \ ^1S$ (9)
Vac 1670. 81†	A	15	0. 00	7. 39	0-1	$3s^2 \ ^1S - 3p \ ^1P^o$ (2)	1539. 74	A	10	7. 39	15. 41	1-2	$3p \ ^1P^o - 4d \ ^1D$ (10)
Air 2087. 0	A	5	4. 64	10. 55	2-2	$3p \ ^3P^o - 3p^2 \ ^1D$ (3)	Air 2631. 553	A	7	10. 55	15. 24	2-3	$3p^2 \ ^1D - 4f \ ^1F^o$ (11)
2081. 5	A	2	4. 62	10. 55	1-2								
Vac 1862. 34	C	10	4. 64	11. 27	2-1	$3p \ ^3P^o - 4s \ ^3S$ (4)	2475. 260	A	4	10. 55	15. 54	2-1	$3p^2 \ ^1D - 5p \ ^1P^o$ (12)
1858. 05	C	7	4. 62	11. 27	1-1								
1855. 95	C	3	4. 62	11. 27	0-1								
1763. 95	A	10	4. 64	11. 64	2-2	$3p \ ^3P^o - 3p^2 \ ^3P^†$ (5)	2902. 14	B	2	11. 27	15. 52	1-2	$4s \ ^3S - 5p \ ^3P^o$ (13)
1763. 79	A	8	4. 62	11. 62	1-1		2903. 22	B	1	11. 27	15. 52	1-1	
1767. 60	A	10	4. 64	11. 62	2-1		2903. 718	B	0. 5	11. 27	15. 52	1-0	
1724. 981	C	15	4. 64	11. 80	2-1	$3p \ ^3P^o - 3d \ ^3D$ (6)	2637. 696	A	5	11. 80	16. 47	3-4	$3d \ ^3D - 5f \ ^3F^o$ (14)
1721. 279	C	10	4. 62	11. 80	1-1		2638. 263	A	4	11. 80	16. 47	2-3	
1719. 459	C	8	4. 62	11. 80	0-1		2638. 695	A	3	11. 80	16. 47	1-2	
							2638. 182	A	0. 5	11. 80	16. 47	3-3	
							2638. 625	A	0. 5	11. 80	16. 47	2-2	
							2638. 547	A	0	11. 80	16. 47	3-2	
Air 2816. 189	B	20	7. 39	11. 77	1-0	$3p \ ^1P^o - 4s \ ^1S$ (7)	2532. 655	A	2	11. 80	16. 67	3-2	$3d \ ^3D - 6p \ ^3P^o$ (15)
Vac 1989. 85	A	2	7. 39	13. 59	1-2	$3p \ ^1P^o - 3d \ ^1D$ (8)	2533. 16	A	1	11. 80	16. 67	2-1	
							2533. 41	A	0. 5	11. 80	16. 67	1-0	

Al III

I P 28.33 Anal A List D May 1947

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Al III

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac 1854. 722	A	10	0. 00	6. 66	$\frac{1}{2} - 1\frac{1}{2}$	$3s \ ^2S - 3p \ ^2P^o$ (1)
1862. 782	A	10	0. 00	6. 63	$\frac{1}{2} - \frac{1}{2}$	
695. 817	B	5	0. 00	17. 74	$\frac{1}{2} - 1\frac{1}{2}$	$3s \ ^2S - 4p \ ^2P^o$ (2)
696. 212	B	4	0. 00	17. 73	$\frac{1}{2} - \frac{1}{2}$	
560. 390	B	7	0. 00	22. 03	$\frac{1}{2} -$	$3s \ ^2S - 5p \ ^2P^o$ (3)

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Si I

I P 8.11 Anal A List A Oct. 1947

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Si I

Si I

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air							Vac						
2516.109†	B	250r	0.03	4.93	2-2	$3p^2\ ^3P - 4s\ ^3P^o$	1850.68	A	50r	0.03	6.70	2-3	$3p^2\ ^3P - 4d\ ^3D^o$
2519.203	B	100r	0.01	4.91	1-1	(1)	1847.47	A	35r	0.01	6.69	1-2	(10)
2528.510	B	175r	0.03	4.91	2-1		1845.53	A	25r	0.00	6.69	0-1	
2524.108	B	125r	0.01	4.90	1-0		1852.48	A	25r	0.03	6.69	2-2	
2506.896	B	150r	0.01	4.93	1-2		1848.16	A	20r	0.01	6.69	1-1	
2514.315	B	100r	0.00	4.91	0-1		1853.17	A	10	0.03	6.69	2-1	
2452.12	A	20	0.03	5.06	2-1	$3p^2\ ^3P - 4s\ ^1P^o$	1841.47	A	20r	0.03	6.73	2-2	$3p^2\ ^3P - 5s\ ^3P^o$
2443.37	A	20	0.01	5.06	1-1	(2)	1843.77	A	15	0.01	6.71	1-1	(11)
2438.77	A	25	0.00	5.06	0-1		1848.75	A	18	0.03	6.71	2-1	
							1846.13	A	12	0.01	6.70	1-0	
2216.670	A	150r	0.03	5.59	2-3	$3p^2\ ^3P - 3d\ ^3D^o$	1836.52	A	20	0.01	6.73	1-2	
2210.880	A	100r	0.01	5.59	1-2	(3)	1841.16	A	10	0.00	6.71	0-1	
2207.972	A	75r	0.00	5.59	0-1								
2218.052	A	50r	0.03	5.59	2-2		1829.89	A	7	0.03	6.77	2-1	$3p^2\ ^3P - 5s\ ^1P^o$
2211.737	A	75r	0.01	5.59	1-1		1825.04	A	1	0.01	6.77	1-1	(12)
2218.914	A	25r	0.03	5.59	2-1		1822.46	A	10	0.00	6.77	0-1	
2121.22	A	7	0.03	5.85	2-2	$3p^2\ ^3P - 3d\ ^1D^o$	1776.85	A	10	0.03	6.98	2-2	$3p^2\ ^3P - 4d\ ^1D^o$
2114.59	A	4b	0.01	5.85	1-2	(4)	1772.24	A	1	0.01	6.98	1-2	(13)
2054.81	A	8	0.03	6.03	2-3	$3p^2\ ^3P - 3p^3\ ^3D^o$	1770.94	A	10	0.03	7.00	2-2	$3p^2\ ^3P - 4d\ ^3P^o$
2061.18	A	8	0.01	6.00	1-2	(5)	*1776.03	A	6	0.01	7.00	1-1	(14)
2065.49	A	5	0.00	5.97	0-1		1770.63	A	8	0.03	7.00	2-1	
2067.40	A	1	0.03	6.00	2-2		1765.02	A	5	0.01	7.00	1-0	
							1766.34	A	5	0.01	7.00	1-2	
							1763.67	A	4	0.00	7.00	0-1	
2010.97	A	8	0.03	6.16	2-3	$3p^2\ ^3P - 3d\ ^3F^o$							
2008.43	A	3	0.01	6.15	1-2	(6)	1747.36	A	4	0.03	7.09	2-3	$3p^2\ ^3P - 4d\ ^3F^o$
							1745.35	A	2	0.01	7.08	1-2	(15)
							1749.74	A	0	0.03	7.08	2-2	
Vac													
1988.36	A	30	0.03	6.23	2-2	$3p^2\ ^3P - 3d\ ^3P^o$	1707.09	A	0	0.03	7.26	2-1	$3p^2\ ^3P - 4d\ ^1P^o$
1980.00	A	10	0.01	6.24	1-1	(7)	1702.81	A	5	0.01	7.26	1-1	(16)
1985.73	A	20	0.03	6.24	2-1		1700.60	A	4	0.00	7.26	0-1	
1978.57	A	12	0.01	6.25	1-0								
1982.60	A	20	0.01	6.23	1-2		1704.44	A	7r	0.03	7.27	2-3	$3p^2\ ^3P - 4d\ ^1F^o$
1976.96	A	15	0.00	6.24	0-1								(17)
1881.86	A	12	0.03	6.59	2-3	$3p^2\ ^3P - 3d\ ^1F^o$	1697.96	A	20r	0.03	7.30	2-3	$3p^2\ ^3P - 5d\ ^3D^o$
						(8)	1696.20	A	20r	0.01	7.29	1-2	(18)
							1693.30	A	7r	0.00	7.29	0-1	
1880.96	A	5	0.03	6.59	2-1	$3p^2\ ^3P - 3d\ ^1P^o$	1700.43	A	15r	0.03	7.29	2-2	
1875.82	A	10	0.01	6.59	1-1	(9)	1695.50	A	5r	0.01	7.29	1-1	
1873.11	A	8	0.00	6.59	0-1		1699.70	A	1	0.03	7.29	2-1	

Si I—Continued

Si I—Continued

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac 1698. 18	A	4b	0. 03	7. 30	2—	$3p^2\ ^3P - 1^\circ$ (19)	Vac 1594. 92	A	4r	0. 03	7. 77	2—2	$3p^2\ ^3P - 8s\ ^3P^\circ$ (34)
1697. 55	A	3b	0. 03	7. 30	2—	$3p^2\ ^3P - 2^\circ$ (20)	1597. 83	A	2	0. 03	7. 75	2—1	
							1595. 50	A	1	0. 01	7. 75	1—0	
							1591. 17	A	0	0. 01	7. 77	1—2	
							1592. 15	A	3r	0. 00	7. 75	0—1	
1686. 83	A	4	0. 03	7. 35	2—2	$3p^2\ ^3P - 6s\ ^3P^\circ$ (21)	1597. 99	A	3	0. 03	7. 75	2—3	$3p^2\ ^3P - 6d\ ^1F^\circ$ (35)
1689. 28	A	3	0. 01	7. 32	1—1								
1693. 47	A	5	0. 03	7. 32	2—1								
1690. 77	A	3	0. 01	7. 31	1—0		1594. 53	A	5r	0. 03	7. 77	2—3	$3p^2\ ^3P - 7d\ ^3D^\circ$ (36)
1682. 67	A	3	0. 01	7. 35	1—2		1592. 35	A	3r	0. 01	7. 76	1—2	
1687. 06	A	1	0. 00	7. 32	0—1		1590. 49	A	2r	0. 00	7. 76	0—1	
							1595. 82	A	1	0. 03	7. 76	2—2	
1676. 80	A	1	0. 00	7. 36	0—1	$3p^2\ ^3P - 6s\ ^1P^\circ$ (22)	1592. 45	A	1	0. 01	7. 76	1—1	
							1589. 60	A	1	0. 03	7. 79	2—1	$3p^2\ ^3P - 8s\ ^1P^\circ$ (37)
1675. 23	A	4r	0. 03	7. 40	2—2	$3p^2\ ^3P - 5d\ ^3P^\circ$ (23)	1586. 00	A	1	0. 01	7. 79	1—1	
1668. 52	A	3	0. 01	7. 41	1—1		*1583. 97	A	0	0. 00	7. 79	0—1	
1672. 60	A	3	0. 03	7. 41	2—1								
1667. 63	A	3	0. 01	7. 41	1—0								
1671. 11	A	2	0. 01	7. 40	1—2		*1583. 97	A	0	0. 03	7. 82	2—3	$3p^2\ ^3P - 7d\ ^3F^\circ$ (38)
1666. 36	A	2	0. 00	7. 41	0—1								
1664. 54	A	2	0. 03	7. 44	2—2	$3p^2\ ^3P - 5d\ ^1D^\circ$ (24)	1576. 76	A	1	0. 03	7. 86	2—3	$3p^2\ ^3P - 7d\ ^1F^\circ$ (39)
1660. 47	A	0	0. 01	7. 44	1—2								
1653. 36	A	1	0. 03	7. 49	2—3	$3p^2\ ^3P - 5d\ ^3F^\circ$ (25)	1573. 85	A	1r	0. 03	7. 87	2—3	$3p^2\ ^3P - 8d\ ^3D^\circ$ (40)
1651. 05	A	0	0. 01	7. 49	1—2								
1633. 15	A	2r	0. 01	7. 57	1—1	$3p^2\ ^3P - 5d\ ^1P^\circ$ (26)	1565. 30	A	1	0. 00	7. 89	0—1	$3p^2\ ^3P - 9s\ ^1P^\circ$ (41)
1631. 11	A	4r	0. 00	7. 57	0—1								
1629. 96	A	8r	0. 03	7. 60	2—3	$3p^2\ ^3P - 6d\ ^3D^\circ$ (27)			-----	-----	-----		
1630. 15	A	7r	0. 01	7. 58	1—2		Air 2970. 35	A	15	0. 78	4. 93	2—2	$3p^2\ ^1D - 4s\ ^3P^\circ$ (42)
1625. 71	A	5r	0. 00	7. 59	0—1		2987. 65	A	25	0. 78	4. 91	2—1	
1633. 99	A	3	0. 03	7. 58	2—2								
1627. 70	A	2	0. 01	7. 59	1—1								
1633. 90	A	4	0. 03	7. 58	2—3	$3p^2\ ^3P - 5d\ ^1F^\circ$ (28)	2881. 595	A	200r	0. 78	5. 06	2—1	$3p^2\ ^1D - 4s\ ^1P^\circ$ (43)
1623. 34	A	0	0. 03	7. 63	2—2	$3p^2\ ^3P - 7s\ ^3P^\circ$ (29)	2563. 67	A	4	0. 78	5. 59	2—2	$3p^2\ ^1D - 3d\ ^3D^\circ$ (44)
1625. 58	A	1	0. 01	7. 60	1—1		2564. 82	A	3	0. 78	5. 59	2—1	
1629. 47	A	7r	0. 03	7. 60	2—1								
1627. 03	A	1	0. 01	7. 60	1—0		2435. 160	A	100r	0. 78	5. 85	2—2	$3p^2\ ^1D - 3d\ ^1D^\circ$ (45)
1619. 53	A	1	0. 01	7. 63	1—2								
1622. 87	A	4r	0. 03	7. 63	2—2	$3p^2\ ^3P - 6d\ ^3P^\circ$ (30)	2291. 03	A	7	0. 78	6. 16	2—3	$3p^2\ ^1D - 3d\ ^3F^\circ$ (46)
1616. 55	A	3	0. 01	7. 65	1—1		2295. 40	A	1	0. 78	6. 15	2—2	
1620. 39	A	3	0. 03	7. 65	2—1								
1619. 00	A	0	0. 01	7. 63	1—2		2261. 70	A	1	0. 78	6. 23	2—2	$3p^2\ ^1D - 3d\ ^3P^\circ$ (47)
1614. 55	A	3	0. 00	7. 65	0—1								
1615. 89	A	3	0. 00	7. 64	0—1	$3p^2\ ^3P - 7s\ ^1P^\circ$ (31)	2124. 111	A	100r	0. 78	6. 59	2—3	$3p^2\ ^1D - 3d\ ^1F^\circ$ (48)
1614. 60	A	1	0. 03	7. 67	2—2	$3p^2\ ^3P - 6d\ ^1D^\circ$ (32)	2122. 99	A	10	0. 78	6. 59	2—1	$3p^2\ ^1D - 3d\ ^1P^\circ$ (49)
1608. 92	A	2	0. 03	7. 70	2—3	$3p^2\ ^3P - 6d\ ^3F^\circ$ (33)	2084. 47	A	20	0. 78	6. 70	2—3	$3p^2\ ^1D - 4d\ ^3D^\circ$ (50)
1605. 87	A	1	0. 01	7. 70	1—2								

Si I—Continued

Si I—Continued

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air 2082. 01	A	15	0. 78	6. 71	2-1	$3p^2\ ^1D-5s\ ^3P^\circ$ (51)	Vac *1766. 03 1769. 60	A A	6 1	0. 78 0. 78	7. 77 7. 75	2-2 2-1	$3p^2\ ^1D-8s\ ^3P^\circ$ (74)
2058. 13	A	50	0. 78	6. 77	2-1	$3p^2\ ^1D-5s\ ^1P^\circ$ (52)	1769. 78	A	15	0. 78	7. 75	2-3	$3p^2\ ^1D-6d\ ^1F^\circ$ (75)
Vac 1991. 23	A	5	0. 78	6. 98	2-2	$3p^2\ ^1D-4d\ ^1D^\circ$ (53)	1765. 61	A	5b	0. 78	7. 77	2-3	$3p^2\ ^1D-7d\ ^3D^\circ$ (76)
1983. 82	A	3	0. 78	7. 00	2-2	$3p^2\ ^1D-4d\ ^3P^\circ$ (54)	1759. 56	A	3	0. 78	7. 79	2-1	$3p^2\ ^1D-8s\ ^1P^\circ$ (77)
1954. 96	A	6	0. 78	7. 09	2-3	$3p^2\ ^1D-4d\ ^3P^\circ$ (55)	1752. 68	A	0	0. 78	7. 82	2-3	$3p^2\ ^1D-7d\ ^3F^\circ$ (78)
1957. 96	A	0	0. 78	7. 08	2-2	$3p^2\ ^1D-4d\ ^1P^\circ$ (56)	1743. 88	A	5b	0. 78	7. 86	2-3	$3p^2\ ^1D-7d\ ^1F^\circ$ (79)
1904. 66	A	12	0. 78	7. 26	2-1	$3p^2\ ^1D-4d\ ^1P^\circ$ (56)	1740. 34	A	3h	0. 78	7. 87	2-3	$3p^2\ ^1D-8d\ ^3D^\circ$ (80)
1901. 34	A	50	0. 78	7. 27	2-3	$3p^2\ ^1D-4d\ ^1F^\circ$ (57)	1736. 50	A	1	0. 78	7. 89	2-1	$3p^2\ ^1D-9s\ ^1P^\circ$ (81)
1893. 22	A	25	0. 78	7. 30	2-3	$3p^2\ ^1D-5d\ ^3D^\circ$ (58)	Air 2842. 35	A	3	1. 90	6. 24	0-1	$3p^2\ ^1S-3d\ ^3P^\circ$ (82)
1895. 41	A	2	0. 78	7. 29	2-1	$3p^2\ ^1D-5d\ ^3D^\circ$ (58)	2631. 28	A	50r	1. 90	6. 59	0-1	$3p^2\ ^1S-3d\ ^1P^\circ$ (83)
1893. 54	A	4	0. 78	7. 30	2-	$3p^2\ ^1D-1^\circ$ (59)	2577. 13	A	10	1. 90	6. 69	0-1	$3p^2\ ^1S-4d\ ^3D^\circ$ (84)
1892. 70	A	3	0. 78	7. 30	2-	$3p^2\ ^1D-2^\circ$ (60)	2568. 63	A	15	1. 90	6. 71	0-1	$3p^2\ ^1S-5s\ ^3P^\circ$ (85)
1887. 71	A	12	0. 78	7. 32	2-1	$3p^2\ ^1D-6s\ ^3P^\circ$ (61)	2532. 38	A	20	1. 90	6. 77	0-1	$3p^2\ ^1S-5s\ ^1P^\circ$ (86)
1874. 86	A	25	0. 78	7. 36	2-1	$3p^2\ ^1D-6s\ ^1P^\circ$ (62)	2303. 03	A	20	1. 90	7. 26	0-1	$3p^2\ ^1S-4d\ ^1P^\circ$ (87)
1865. 04	A	2	0. 78	7. 40	2-2	$3p^2\ ^1D-5d\ ^3P^\circ$ (63)	2289. 61	A	10	1. 90	7. 29	0-1	$3p^2\ ^1S-5d\ ^3D^\circ$ (88)
1861. 80	A	1	0. 78	7. 41	2-1	$3p^2\ ^1D-5d\ ^3P^\circ$ (63)	2278. 30	A	7	1. 90	7. 32	0-1	$3p^2\ ^1S-6s\ ^3P^\circ$ (89)
1851. 80	A	10	0. 78	7. 44	2-2	$3p^2\ ^1D-5d\ ^1D^\circ$ (64)	2259. 58	A	7	1. 90	7. 36	0-1	$3p^2\ ^1S-6s\ ^1P^\circ$ (90)
1838. 00	A	10	0. 78	7. 49	2-3	$3p^2\ ^1D-5d\ ^3F^\circ$ (65)	2177. 30	A	8b	1. 90	7. 57	0-1	$3p^2\ ^1S-5d\ ^1P^\circ$ (91)
1840. 00	A	2	0. 78	7. 49	2-2	$3p^2\ ^1D-5d\ ^1P^\circ$ (66)	2167. 74	A	7	1. 90	7. 59	0-1	$3p^2\ ^1S-6d\ ^3D^\circ$ (92)
1817. 87	A	2b	0. 78	7. 57	2-1	$3p^2\ ^1D-5d\ ^1P^\circ$ (66)	2163. 78	A	10b	1. 90	7. 60	0-1	$3p^2\ ^1S-7s\ ^3P^\circ$ (93)
1809. 05	A	30	0. 78	7. 60	2-3	$3p^2\ ^1D-6d\ ^3D^\circ$ (67)	2147. 91	A	3	1. 90	7. 65	0-1	$3p^2\ ^1S-6d\ ^3P^\circ$ (94)
1814. 09	A	30	0. 78	7. 58	2-2	$3p^2\ ^1D-6d\ ^3D^\circ$ (67)	2150. 43	A	5	1. 90	7. 64	0-1	$3p^2\ ^1S-7s\ ^1P^\circ$ (95)
1814. 02	A	50	0. 78	7. 58	2-3	$3p^2\ ^1D-5d\ ^1F^\circ$ (68)	2094. 20	A	2	1. 90	7. 79	0-1	$3p^2\ ^1S-8s\ ^1P^\circ$ (96)
1808. 48	A	4b	0. 78	7. 60	2-1	$3p^2\ ^1D-7s\ ^3P^\circ$ (69)							
1797. 33	A	3	0. 78	7. 65	2-1	$3p^2\ ^1D-6d\ ^3P^\circ$ (70)							
1799. 14	A	10	0. 78	7. 64	2-1	$3p^2\ ^1D-7s\ ^1P^\circ$ (71)							
1790. 28	A	4	0. 78	7. 67	2-2	$3p^2\ ^1D-6d\ ^1D^\circ$ (72)							
1783. 23	A	8	0. 78	7. 70	2-3	$3p^2\ ^1D-6d\ ^3F^\circ$ (73)							
1784. 11	A	1	0. 78	7. 70	2-2	$3p^2\ ^1D-6d\ ^3F^\circ$ (73)							

Si II

I P 16.27 Anal B List A Sept. 1948

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Si II

Si II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1816.94†	B	8	0.04	6.83	$1\frac{1}{2}-2\frac{1}{2}$	$3p\ ^2P^\circ-3p^2\ ^2D$	1711.0	C	6d?	6.83	14.04		$3p^2\ ^2D-5f\ ^2F^\circ$
1808.01	B	7	0.00	6.83	$\frac{1}{2}-1\frac{1}{2}$	(1)						(10)	
1817.42	B	2	0.04	6.83	$1\frac{1}{2}-1\frac{1}{2}$		1563.1	C	3d?	6.83	14.73		$3p^2\ ^2D-6f\ ^2F^\circ$
1533.44	B	5	0.04	8.09	$1\frac{1}{2}-\frac{1}{2}$	$3p\ ^2P^\circ-4s\ ^2S$						(11)	
1526.70	B	4	0.00	8.09	$\frac{1}{2}-\frac{1}{2}$	(2)	1485.4	C	3	6.83	15.14		$3p^2\ ^2D-7f\ ^2F^\circ$
1309.28	A	2	0.04	9.46	$1\frac{1}{2}-\frac{1}{2}$	$3p\ ^2P^\circ-3p^2\ ^2S$						(12)	
1304.41	A	1	0.00	9.46	$\frac{1}{2}-\frac{1}{2}$	(3)	1438.9	C	1	6.83	15.41		$3p^2\ ^2D-8f\ ^2F^\circ$
1265.04	C	10	0.04	9.80	$1\frac{1}{2}-2\frac{1}{2}$	$3p\ ^2P^\circ-3d\ ^2D$						(13)	
1260.66	C	8	0.00	9.79	$\frac{1}{2}-1\frac{1}{2}$	(4)	1408.8	C	0	6.83	15.59		$3p^2\ ^2D-9f\ ^2F^\circ$
1194.50	D	5	0.04	10.37	$1\frac{1}{2}-1\frac{1}{2}$	$3p\ ^2P^\circ-3p^2\ ^2P$						(14)	
1193.31	D	3	0.00	10.35	$\frac{1}{2}-\frac{1}{2}$	(5)	Air						
1197.42	D	3	0.04	10.35	$1\frac{1}{2}-\frac{1}{2}$		2604.44	C	2	8.09	12.82	$\frac{1}{2}-1\frac{1}{2}$	$4s\ ^2S-5p\ ^2P^\circ$
1190.42	D	4	0.00	10.37	$\frac{1}{2}-1\frac{1}{2}$		2606.09	C	1	8.09	12.82	$\frac{1}{2}-\frac{1}{2}$	(15)
993.09	C	1	0.04	12.47	$1\frac{1}{2}-2\frac{1}{2}$	$3p\ ^2P^\circ-4d\ ^2D$	2058.532	C	1	8.09	14.08	$\frac{1}{2}-1\frac{1}{2}$	$4s\ ^2S-6p\ ^2P^\circ$
990.32	C	0	0.00	12.47	$\frac{1}{2}-1\frac{1}{2}$	(6)	2058.917	C	0	8.09	14.08	$\frac{1}{2}-\frac{1}{2}$	(16)
1350.07	E	4	(5.48)	(14.62)	$2\frac{1}{2}-2\frac{1}{2}$	$3p^2\ ^4P-4s\ ^4P^\circ$							
1350.58	E	3	(5.46)	(14.60)	$1\frac{1}{2}-1\frac{1}{2}$	(7)	2905.70	C	3	9.80	14.04	$2\frac{1}{2}-$	$3d\ ^2D-5f\ ^2F^\circ$
1353.75	E	3	(5.48)	(14.60)	$2\frac{1}{2}-1\frac{1}{2}$		2904.29	C	2	9.79	14.04	$1\frac{1}{2}-2\frac{1}{2}$	(17)
1352.68	E	3	(5.46)	(14.58)	$1\frac{1}{2}-\frac{1}{2}$		2501.99	C	1	9.80	14.73	$2\frac{1}{2}-$	$3d\ ^2D-6f\ ^2F^\circ$
1346.92	E	3	(5.46)	(14.62)	$1\frac{1}{2}-2\frac{1}{2}$		2500.96	C	1	9.79	14.73	$1\frac{1}{2}-2\frac{1}{2}$	(18)
1348.55	E	3	(5.44)	(14.60)	$\frac{1}{2}-1\frac{1}{2}$								
1251.16	E	4	(5.48)	(15.34)	$2\frac{1}{2}-1\frac{1}{2}$	$3p^2\ ^4P-3p^3\ ^4S^\circ$							
1248.40	E	3	(5.46)	(15.34)	$1\frac{1}{2}-1\frac{1}{2}$	(8)	2726.74	C	2	10.03	14.56	$1\frac{1}{2}-\frac{1}{2}$	$4p\ ^2P^\circ-7s\ ^2S$
1246.73	E	3	(5.44)	(15.34)	$\frac{1}{2}-1\frac{1}{2}$		2722.29	C	1	10.02	14.56	$\frac{1}{2}-\frac{1}{2}$	(19)
Air							2682.27	C	2	10.03	14.63	$1\frac{1}{2}-$	$4p\ ^2P^\circ-6d\ ^2D$
2072.61	C	10	6.83	12.78	$2\frac{1}{2}-$	$3p^2\ ^2D-4f\ ^2F^\circ$	2677.98	C	1	10.02	14.63	$\frac{1}{2}-1\frac{1}{2}$	(20)
2071.94	C	8	6.83	12.78	$1\frac{1}{2}-2\frac{1}{2}$	(9)							

Si III

I P 33.32 Anal B List D July 1947

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Si III

Si III

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac 1895.46	A	2	0.00	6.51	0-1	$3s^2 \ ^1S - 3p \ ^3P^o$ (1)	Vac 997.40 994.82 993.54	A A A	5 5 5	6.55 6.51 6.50	18.92 18.92 18.92	2-1 1-1 0-1	$3p \ ^3P^o - 4s \ ^3S$ (6)
1206.52	A	10	0.00	10.23	0-1	$3s^2 \ ^1S - 3p \ ^1P^o$ (2)							
566.54	A	3	0.00	21.79	0-1	$3s^2 \ ^1S - 4p \ ^1P^o$ (3)	Air 2559.22	B	7	10.23	15.05	1-2	$3p \ ^1P^o - 3p^2 \ ^1D$ (7)
*1298.90	A	8	6.55 6.51	16.05 16.02	2-2 1-1	$3p \ ^3P^o - 3p^2 \ ^3P$ (4)	2541.83	B	10	10.23	15.09	1-2	$3p \ ^1P^o - 3d \ ^1D$ (8)
1303.30	A	7	6.55	16.02	2-1		Vac 1417.20	A	5	10.23	18.94	1-0	$3p \ ^1P^o - 3p^2 \ ^1S$ (9)
1301.12	A	7	6.51	16.00	1-0								
1294.55	A	7	6.51	16.05	1-2								
1296.72	A	7	6.50	16.02	0-1		1312.61	A	4	10.23	19.64	1-0	$3p \ ^1P^o - 4s \ ^1S$ (10)
1113.20	A	9	6.55	17.63	2-	$3p \ ^3P^o - 3d \ ^3D$							
1109.95	A	8	6.51	17.63	1-	(5)							
1108.35	A	7	6.50	17.64	0-1								

Si IV

I P 44.95 Anal B List D Sept. 1948

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Si IV

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac 1393.73 1402.73	A A	10 8	0.00 0.00	8.86 8.80	$\frac{1}{2} - 1\frac{1}{2}$ $\frac{1}{2} - \frac{1}{2}$	$3s \ ^2S - 3p \ ^2P^o$ (1)
457.7	B	(3)	0.00	26.97	$\frac{1}{2} -$	$3s \ ^2S - 4p \ ^2P^o$ (2)
1128.326 1122.495	A A	5 4	8.86 8.80	19.80 19.80	$1\frac{1}{2} - 2\frac{1}{2}$ $\frac{1}{2} - 1\frac{1}{2}$	$3p \ ^2P^o - 3d \ ^2D$ (3)
818.121 815.060	A A	4 3	8.86 8.80	23.95 23.95	$1\frac{1}{2} - \frac{1}{2}$ $\frac{1}{2} - \frac{1}{2}$	$3p \ ^2P^o - 4s \ ^2S$ (4)

PHOSPHORUS

P I

I P 10.9 Anal B List C Nov. 1947

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P I

P I

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1774. 942†	A	(12)	0. 00	6. 96	1½—2½	3p³ ⁴S°—4s ⁴P	1685. 957	A	(11)	1. 40	8. 73	2½—3½	3p³ ²D°—3d ²F†
1782. 830	A	(12)	0. 00	6. 92	1½—1½	(1)	1694. 055	A	(10)	1. 40	8. 69	1½—2½	(6)
1787. 686	A	(12)	0. 00	6. 91	1½—½								
1679. 730	A	(12)	0. 00	7. 35	1½—2½	3p³ ⁴S°—3p⁴ ⁴P							
1674. 661	A	(12)	0. 00	7. 37	1½—1½	(2)							
1671. 720	A	(6)	0. 00	7. 38	1½—½		Air						
							2677. 12	B	5	2. 31	6. 92	1½—1½	3p³ ²P°—4s ⁴P†
							2688. 02	B	2	2. 31	6. 91	1½—½	(7)
Air							2535. 65	B	50	2. 31	7. 18	1½—1½	3p³ ²P°—4s ²P
2223. 35	B	3	1. 40	6. 96	2½—2½	3p³ ²D°—4s ⁴P	2553. 28	B	40	2. 31	7. 14	½—½	(8)
2234. 99	B	3	1. 40	6. 92	1½—1½	(3)	2554. 93	B	30	2. 31	7. 14	1½—½	
2235. 77	B	5	1. 40	6. 92	2½—1½		2534. 01	B	25	2. 31	7. 18	½—1½	
2222. 59	B	0	1. 40	6. 96	1½—2½								
2136. 199	A	(11)	1. 40	7. 18	2½—1½	3p³ ²D°—4s ²P	2154. 081	A	(12)	2. 31	8. 04	1½—	3p³ ²P°—4s' ²D
2149. 108	A	(12)	1. 40	7. 14	1½—½	(4)	2152. 950	A	(11)	2. 31	8. 04	½—	(9)
2135. 466	A	(10)	1. 40	7. 18	1½—1½		2033. 489	A	(10)	2. 31	8. 38	1½—1½	3p³ ²P°—3p⁴ ²P
Vac							2023. 472	A	(6)	2. 31	8. 41	½—½	(10)
1859. 401	A	(12)	1. 40	8. 04	2½—	3p³ ²D°—4s' ²D	2024. 546	A	(6)	2. 31	8. 41	1½—½	
1858. 924	A	(12)	1. 40	8. 04	1½—	(5)	2032. 447	A	(8)	2. 31	8. 38	½—1½	

P II

I P 19.57 Anal B List C Oct. 1947

REFERENCES

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 B I. S. Bowen, Phys. Rev. **29**, 510 (1927). W L, (I), T

P II

P II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Air						
1542.321†	A	15	0.06	8.06	2-3	$3p^2\ ^3P-3p^3\ ^3D^{\circ}$ (1)	2606.01	B	(3)	8.06	12.80	3-3	$3p^3\ ^3D^{\circ}-4p\ ^3D$ (4)
1535.955	A	12	0.02	8.06	1-2		2626.16	B	(4)	8.06	12.76	2-2	
1532.558	A	12	0.00	8.06	0-1		2636.78	B	(3)	8.06	12.74	1-1	
1543.144	A	12	0.06	8.06	2-2		2628.55	B	(2)	8.06	12.76	3-2	
1536.459	A	12	0.02	8.06	1-1		2638.18	B	(2)	8.06	12.74	2-1	
1543.638	A	2	0.06	8.06	2-1		2603.71	B	(2)	8.06	12.80	2-3	
							2624.76	B	(3)	8.06	12.76	1-2	
1310.685	A	10	0.06	9.48	2-2	$3p^2\ ^3P-3p^3\ ^3P^{\circ}$ (2)							$3p^3\ ^3D^{\circ}-4p\ ^3P$ (5)
1304.688	A	10	0.02	9.48	1-1		2484.152	A	8	8.06	13.03	3-2	
1309.877	A	10	0.06	9.48	2-1		2497.328	A	8	8.06	13.00	2-1	
1304.484	A	10	0.02	9.48	1-0		2500.922	A	7	8.06	12.99	1-0	
1305.531	A	10	0.02	9.48	1-2		2481.984	A	3	8.06	13.03	2-2	
1301.878	A	10	0.00	9.48	0-1		2496.003	A	7	8.06	13.00	1-1	
							2480.704	A	0	8.06	13.03	1-2	
1153.997	A	10	0.06	10.76	2-2	$3p^2\ ^3P-4s\ ^3P^{\circ}$ (3)							$4s\ ^3P^{\circ}-5$ (6)
1155.020	A	10	0.02	10.71	1-1								
1159.085	A	10	0.06	10.71	2-1								
1156.968	A	10	0.02	10.69	1-0								
1149.960	A	10	0.02	10.76	1-2								
1152.803	A	10	0.00	10.71	0-1								
							2281.003	A	10	10.76	16.17	2-	
							2285.114	A	10	10.97	16.37	1-	$4s\ ^1P^{\circ}-19$ (7)

P III

I P 30.03 Anal A List D April 1949

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I P 10.31 Anal A List B Dec. 1947

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S I

S I

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1900. 27	A	20R	0. 00	6. 50	2-2	$3p^4\ ^3P-4s\ ^5S^\circ$	1316. 59	A	8R	0. 00	9. 38	2-3	$3p^4\ ^3P-4d\ ^3D^\circ$
1914. 68	A	15R	0. 05	6. 50	1-2	(1)	1323. 52	A	10R	0. 05	9. 38	1-2	(8)
							1326. 64	A	9R	0. 07	9. 38	0-1	
1807. 31†	A	25R	0. 00	6. 83	2-1	$3p^4\ ^3P-4s\ ^3S^\circ$	1295. 62	A	6	0. 00	9. 53	2-2	$3p^4\ ^3P-4s''\ ^3P^\circ$
1820. 37	A	25R	0. 05	6. 83	1-1	(2)	1302. 86	A	6R	0. 05	9. 52	1-1	(9)
1826. 25	A	25R	0. 07	6. 83	0-1		1296. 18	A	5	0. 00	9. 52	2-1	
							1303. 12	A	7R	0. 05	9. 52	1-0	
1473. 98	A	15R	0. 00	8. 38	2-3	$3p^4\ ^3P-4s'\ ^3D^\circ$	1302. 32	A	9R	0. 05	9. 53	1-2	
1483. 05	A	15R	0. 05	8. 37	1-2	(3)	1305. 89	A	9R	0. 07	9. 52	0-1	
1487. 12	A	15R	0. 07	8. 37	0-1								
1474. 37	A	12R	0. 00	8. 37	2-2								
1483. 24	A	12R	0. 05	8. 37	1-1								
1474. 54	A	6R	0. 00	8. 37	2-1								
1472. 97	A	15R	0. 00	8. 38	2-3	$3p^4\ ^3P-3d\ ^5D^\circ$	1706. 38	A	8	1. 14	8. 38	2-3	$3p^4\ ^1D-4s'\ ^3D^\circ$
1481. 65	A	15R	0. 05	8. 38	1-2	(4)	1707. 13	A	8	1. 14	8. 37	2-1	(10)
1485. 61	A	12	0. 07	8. 38	0-1		1666. 68	A	25R	1. 14	8. 55	2-2	$3p^4\ ^1D-4s'\ ^1D^\circ$
													(11)
1425. 10	A	15R	0. 00	8. 66	2-3	$3p^4\ ^3P-3d\ ^3D^\circ$	1448. 20	A	12R	1. 14	9. 66	2-1	$3p^4\ ^1D-4s''\ ^1P^\circ$
1433. 28	A	15R	0. 05	8. 66	1-2	(5)							(12)
1436. 94	A	12R	0. 07	8. 66	0-1								
1401. 50	A	10R	0. 00	8. 81	2-1	$3p^4\ ^3P-5s\ ^3S^\circ$	1782. 25	A	12R	2. 74	9. 66	0-1	$3p^4\ ^1S-4s''\ ^1P^\circ$
1409. 32	A	12R	0. 05	8. 81	1-1	(6)							(13)
1412. 85	A	12R	0. 07	8. 81	0-1								
1388. 39	A	12R	0. 00	8. 89	2-2	$3p^4\ ^3P-3p^5\ ^3P^\circ$							
1389. 16	A	5R	0. 05	8. 94	1-1	(7)							
1381. 55	A	15R	0. 00	8. 94	2-1								
1385. 51	A	12R	0. 05	8. 96	1-0								
1396. 10	A	15R	0. 05	8. 89	1-2								
1392. 59	A	12R	0. 07	8. 94	0-1								

S II

I P 23.3 Anal B List C Oct. 1947

REFERENCES

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S II

S II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1259.53†	A	5	0.00	9.80	$1\frac{1}{2}-2\frac{1}{2}$	$3p^3\ ^4S^\circ-3p^4\ ^4P$	1234.14	A	3	3.03	13.04	$1\frac{1}{2}-1\frac{1}{2}$	$3p^3\ ^2P^\circ-3p^4\ ^2P$
1253.79	A	5	0.00	9.85	$1\frac{1}{2}-1\frac{1}{2}$	(1)	1226.70	A	1	3.03	13.09	$\frac{1}{2}-\frac{1}{2}$	(7)
1250.50	A	3	0.00	9.87	$1\frac{1}{2}-\frac{1}{2}$		1227.45	A	1	3.03	13.09	$1\frac{1}{2}-\frac{1}{2}$	
							1233.36	A	0	3.03	13.04	$\frac{1}{2}-1\frac{1}{2}$	
906.87	A	3	0.00	13.61	$1\frac{1}{2}-2\frac{1}{2}$	$3p^3\ ^4S^\circ-4s\ ^4P$	1125.00	A	1	3.03	14.01	$1\frac{1}{2}-1\frac{1}{2}$	$3p^3\ ^2P^\circ-4s\ ^2P$
910.49	A	3	0.00	13.56	$1\frac{1}{2}-1\frac{1}{2}$	(2)	1131.05	A	2	3.03	13.94	$\frac{1}{2}-\frac{1}{2}$	(8)
912.74	A	3	0.00	13.53	$1\frac{1}{2}-\frac{1}{2}$		1131.65	A	2	3.03	13.94	$1\frac{1}{2}-\frac{1}{2}$	
							1124.39	A	1	3.03	14.01	$\frac{1}{2}-1\frac{1}{2}$	
1102.32	A	3	1.84	13.04	$2\frac{1}{2}-1\frac{1}{2}$	$3p^3\ ^2D^\circ-3p^4\ ^2P$	1031.34	A	1	3.03	15.00	$1\frac{1}{2}-$	$3p^3\ ^2P^\circ-4s'\ ^2D$
1096.57	A	2	1.83	13.09	$1\frac{1}{2}-\frac{1}{2}$	(3)	1030.87	A	1	3.03	15.00	$\frac{1}{2}-1\frac{1}{2}$	(9)
1014.42	A	2	1.84	14.01	$2\frac{1}{2}-1\frac{1}{2}$	$3p^3\ ^2D^\circ-4s\ ^2P^\dagger$							
1019.53	A	2	1.83	13.94	$1\frac{1}{2}-\frac{1}{2}$	(4)							
996.00	A	2	1.84	14.23	$2\frac{1}{2}-3\frac{1}{2}$	$3p^3\ ^2D^\circ-3d\ ^2F$	Air						
1000.48	A	2	1.83	14.17	$1\frac{1}{2}-2\frac{1}{2}$	(5)	2847.73	B	(3)	13.04	17.37	$1\frac{1}{2}-2\frac{1}{2}$	$3p^4\ ^2P-4p'\ ^2D^\circ$
							2881.01	B	(1)	13.09	17.38	$\frac{1}{2}-1\frac{1}{2}$	(10)
937.69	A	3	1.84	15.00	$2\frac{1}{2}-$	$3p^3\ ^2D^\circ-4s'\ ^2D$	2629.1	A	2	13.04	17.73	$1\frac{1}{2}-1\frac{1}{2}$	$3p^4\ ^2P-4p'\ ^2P^\circ\dagger$
937.41	A	3	1.83	15.00	$1\frac{1}{2}-$	(6)	2670.0	A	3	13.09	17.71	$\frac{1}{2}-\frac{1}{2}$	(11)

S III

I P 34.9 Anal B List C Oct. 1947

REFERENCES

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 B H. A. Robinson, Phys. Rev. **52**, 724 (1937). W L, I, T
 A. Hunter, Phil. Trans. Roy. Soc. London [A] **233**, 303 (1934). T

S III

S III

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1200. 97	A	4	0. 10	10. 38	2-3	$3p^2\ ^3P-3p^3\ ^3D^\circ$ (1)	738. 474	B	4	1. 40	18. 11	2-1	$3p^2\ ^1D-4s\ ^3P^\circ\uparrow$ (11)
1194. 02	A	4	0. 04	10. 38	1-2								
1190. 17	A	2	0. 00	10. 37	0-1								
1201. 71	A	2	0. 10	10. 38	2-2		729. 529	B	4	1. 40	18. 32	2-1	$3p^2\ ^1D-4s\ ^1P^\circ$ (12)
1194. 40	A	3	0. 04	10. 37	1-1								
1202. 10	A	0	0. 10	10. 37	2-1								
1021. 32	A	2	0. 10	12. 19	2-2	$3p^2\ ^3P-3p^3\ ^3P^\circ$ (2)	836. 315	B	4	3. 35	18. 11	0-1	$3p^2\ ^1S-4s\ ^3P^\circ$ (13)
*1015. 51	A	2	0. 04	12. 19	1-1								
1021. 10	A	1	0. 10	12. 19	2-1								
*1015. 51	A	2	0. 04	12. 19	1-0		824. 887	B	4	3. 35	18. 32	0-1	$3p^2\ ^1S-4s\ ^1P^\circ$ (14)
1015. 76	A	1	0. 04	12. 19	1-2								
1012. 49	A	3	0. 00	12. 19	0-1								
735. 251	B	4	0. 10	16. 89	2-1	$3p^2\ ^3P-3p^3\ ^1P^\circ$ (3)	Air						
732. 376	B	5	0. 04	16. 89	1-1		2863. 53	A	5	21. 07	25. 38	3-4	$4p\ ^3D-4d\ ^3F^\circ\uparrow$ (15)
730. 783	B	0	0. 00	16. 89	0-1		2856. 02	A	4	20. 99	25. 32	2-3	
							2872. 00	A	2	20. 96	25. 26	1-2	
							2904. 31	A	6	21. 07	25. 32	3-3	
728. 69	A	3	0. 10	17. 04	2-1	$3p^2\ ^3P-3p^3\ ^3S^\circ$ (4)	2756. 89	A	8	21. 07	25. 54	3-3	$4p\ ^3D-4d\ ^3D^\circ\uparrow$ (16)
725. 86	A	3	0. 04	17. 04	1-1		2731. 10	A	7	20. 99	25. 51	2-2	
724. 29	A	3	0. 00	17. 04	0-1		2718. 88	A	7	20. 96	25. 50	1-1	
							2775. 25	A	5	21. 07	25. 51	3-2	
							2741. 01	A	5	20. 99	25. 50	2-1	
702. 78	P		0. 10	17. 67	2-2	$3p^2\ ^3P-3d\ ^3P^\circ$ (5)	2496. 24	A	6	21. 07	26. 01	3-2	$4p\ ^3D-5s\ ^3P^\circ\uparrow$ (17)
*700. 15	A	3	0. 04	17. 67	1-1		2508. 15	A	7	20. 99	25. 92	2-1	
702. 82	P		0. 10	17. 67	2-1		2499. 08	A	6	20. 96	25. 90	1-0	
700. 29	A	3	0. 04	17. 67	1-0		2460. 50	A	5	20. 99	26. 01	2-2	
*700. 15	A	3	0. 04	17. 67	1-2		2489. 59	A	5	20. 96	25. 92	1-1	
698. 73	A	2	0. 00	17. 67	0-1								
683. 47	A	1	0. 10	18. 17	2-2	$3p^2\ ^3P-4s\ ^3P^\circ$ (6)	2964. 80	A	4	21. 38	25. 54	2-3	$4p\ ^3P-4d\ ^3D^\circ\uparrow$ (18)
685. 35	A	0	0. 10	18. 11	2-1		2950. 23	A	3	21. 33	25. 51	1-2	
683. 07	A	0	0. 04	18. 11	1-0		2985. 98	A	6	21. 38	25. 51	2-2	
*680. 95	A	2	0. 04	18. 17	1-2								
*681. 50	A	1	0. 00	18. 11	0-1		2665. 40	A	7	21. 38	26. 01	2-2	$4p\ ^3P-5s\ ^3P^\circ$ (19)
680. 69	A	2	0. 10	18. 24	2-3	$3p^2\ ^3P-3d\ ^3D^\circ$ (7)	2691. 68	A	5	21. 33	25. 92	1-1	
678. 46	A	2	0. 04	18. 23	1-2		2721. 40	A	5	21. 38	25. 92	2-1	
677. 75	A	2	0. 00	18. 22	0-1		2702. 76	A	5	21. 33	25. 90	1-0	
*680. 95	A	2	0. 10	18. 23	2-2		2636. 88	A	4	21. 33	26. 01	1-2	
679. 11	A	2	0. 04	18. 22	1-1		2680. 47	A	4	21. 31	25. 92	0-1	
*681. 50	A	1	0. 10	18. 22	2-1								
1077. 835	B	8	1. 40	12. 86	2-2	$3p^2\ ^1D-3p^3\ ^1D^\circ$ (8)							
796. 692	B	4	1. 40	16. 89	2-1	$3p^2\ ^1D-3p^3\ ^1P^\circ$ (9)	2726. 82	A	7	21. 48	26. 01	1-2	$4p\ ^3S-5s\ ^3P^\circ$ (20)
						2785. 49	A	6	21. 48	25. 92	1-1		
788. 984	B	4	1. 40	17. 04	2-1	$3p^2\ ^1D-3p^3\ ^3S^\circ$ (10)	2797. 39	A	4	21. 48	25. 90	1-0	

S IV

I P 47.1 Anal C List C Sept. 1948

REFERENCES

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 B R. A. Millikan and I. S. Bowen, Phys. Rev. **25**, 600 (1925). W L, I, T
 C I. S. Bowen, Phys. Rev. **39**, 13 (1932). W L, I, T

S IV

S IV

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1072. 992	A	6	0. 12	11. 62	$1\frac{1}{2}-2\frac{1}{2}$	$3p\ ^2P^{\circ}-3p^2\ ^2D$							
1062. 672	A	6	0. 00	11. 62	$\frac{1}{2}-1\frac{1}{2}$	(1)							
1073. 522	A	4	0. 12	11. 62	$1\frac{1}{2}-1\frac{1}{2}$		803. 996	C	4	(8. 98	24. 33)	$2\frac{1}{2}-1\frac{1}{2}$	$3p^2\ ^4P - 3p^3\ ^4S^{\circ}$
815. 97	B	5	0. 12	15. 25	$1\frac{1}{2}-\frac{1}{2}$	$3p\ ^2P^{\circ}-3p^2\ ^2S$	800. 477	C	4	(8. 91	24. 33)	$1\frac{1}{2}-1\frac{1}{2}$	(6)
809. 69	B	4	0. 00	15. 25	$\frac{1}{2}-\frac{1}{2}$	(2)	798. 277	C	3	(8. 87	24. 33)	$\frac{1}{2}-1\frac{1}{2}$	
750. 23	B	5	0. 12	16. 57	$1\frac{1}{2}-1\frac{1}{2}$	$3p\ ^2P^{\circ}-3p^2\ ^2P$	666. 114	C	4	(8. 98	27. 51)	$2\frac{1}{2}-2\frac{1}{2}$	$3p^2\ ^4P - 3d\ ^4P^{\circ}$
748. 40	B	5	0. 00	16. 50	$\frac{1}{2}-\frac{1}{2}$	(3)	664. 822	C	3	(8. 98	27. 55)	$2\frac{1}{2}-1\frac{1}{2}$	(7)
753. 76	B	5	0. 12	16. 50	$1\frac{1}{2}-\frac{1}{2}$		663. 707	C	3	(8. 91	27. 51)	$1\frac{1}{2}-2\frac{1}{2}$	
744. 92	B	5	0. 00	16. 57	$\frac{1}{2}-\frac{1}{2}$		660. 945	C	3	(8. 87	27. 55)	$\frac{1}{2}-1\frac{1}{2}$	
661. 42	B	6	0. 12	18. 78	$1\frac{1}{2}-2\frac{1}{2}$	$3p\ ^2P^{\circ}-3d\ ^2D$	655. 553	C	4	(8. 98	27. 81)	$2\frac{1}{2}-3\frac{1}{2}$	$3p^2\ ^4P - 3d\ ^4D^{\circ}\dagger$
657. 34	B	5	0. 00	18. 78	$\frac{1}{2}-1\frac{1}{2}$	(4)	653. 560	C	4	(8. 91	27. 80)	$1\frac{1}{2}-2\frac{1}{2}$	(8)
551. 17	B	2	0. 00	22. 40	$\frac{1}{2}-\frac{1}{2}$	$3p\ ^2P^{\circ}-4s\ ^2S$	652. 523	C	3	(8. 87	27. 79)	$\frac{1}{2}-1\frac{1}{2}$	
						(5)							

S v

I P 72.2 Anal C List C Sept. 1948

REFERENCE

- A I. S. Bowen, Phys. Rev. **39**, 8 (1932). W L, I, T

S v

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac 786. 476	A	8	0. 00	15. 70	0-1	$3s^2\ ^1S - 3p\ ^1P^o$ (1)
*854. 792	A	7	{(10. 39	24. 84)	2-2	$3p\ ^3P^o - 3p^2\ ^3P$ (2)
860. 462	A	5	{(10. 30	24. 74)	1-1	
857. 872	A	5	{(10. 39	24. 74)	2-1	
849. 241	A	6	{(10. 30	24. 69)	1-0	
852. 185	A	5	{(10. 30	24. 84)	1-2	
			{(10. 26	24. 74)	0-1	
*663. 155	A	5	(10. 39	29. 01)	2-3	$3p\ ^3P^o - 3d\ ^3D$ (3)
*659. 853	A	4	(10. 30	29. 01)	1-2	
658. 262	A	3	(10. 26	29. 01)	0-1	
*663. 155	A	5	(10. 39	29. 01)	2-2	
*659. 853	A	4	(10. 30	29. 01)	1-1	
*663. 155	A	5	(10. 39	29. 01)	2-1	
439. 65	A	1	(10. 39	38. 48)	2-1	$3p\ ^3P^o - 4s\ ^3S$ (4)
438. 19	A	1	(10. 30	38. 48)	1-1	
437. 37	A	1	(10. 26	38. 48)	0-1	

S vi

I P 87.67 Anal B List C Sept. 1948

REFERENCES

- A H. A. Robinson, Phys. Rev. **52**, 724 (1937). W L, I, T
 B I. S. Bowen and R. A. Millikan, Phys. Rev. **25**, 295 (1925). (I), T

S vi

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac 933. 382	A	(5)	0. 00	13. 23	$\frac{1}{2} - \frac{1}{2}$	$3s\ ^2S - 3p\ ^2P^o$ (1)
944. 517	A	(4)	0. 00	13. 07	$\frac{1}{2} - \frac{1}{2}$	
248. 985	A	4	0. 00	13. 23	$\frac{1}{2} - \frac{1}{2}$	$3s\ ^2S - 4p\ ^2P^o$ (2)
249. 271	A	4	0. 00	13. 07	$\frac{1}{2} - \frac{1}{2}$	
712. 682	A	(2)	13. 23	30. 55	$1\frac{1}{2} - 2\frac{1}{2}$	$3p\ ^2P^o - 3d\ ^2D$ (3)
706. 480	A	(1)	13. 07	30. 54	$\frac{1}{2} - \frac{1}{2}$	
712. 844	A	(0)	13. 23	30. 54	$1\frac{1}{2} - 1\frac{1}{2}$	
390. 859	A	8	13. 23	44. 81	$1\frac{1}{2} - \frac{1}{2}$	$3p\ ^2P^o - 4s\ ^2S$ (4)
388. 940	A	6	13. 07	44. 81	$\frac{1}{2} - \frac{1}{2}$	
464. 654	A	10	30. 55	57. 11		$3d\ ^2D - 4f\ ^2F^o$ (5)

CHLORINE

Cl I

I P 12.9 Anal A List A Jan. 1948

REFERENCES

- A L. A. Turner, Phys. Rev. **27**, 397 (1926). W L, I, T
 C. C. Kiess, Bur. Std. J. Research **10**, 827, RP570 (1933). T
 J. B. Green and J. T. Lynn, Phys. Rev. **69**, 165 (1946). T

Cl I

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac						
*1389.9	A	4	0.00	8.88	$1\frac{1}{2}-2\frac{1}{2}$	$3p^5\ ^2P^\circ-4s\ ^4P$ (1)
1396.5	A	3	0.11	8.95	$\frac{1}{2}-1\frac{1}{2}$	
1379.6	A	5	0.00	8.95	$1\frac{1}{2}-1\frac{1}{2}$	
*1389.9	A	4	0.11	8.99	$\frac{1}{2}-\frac{1}{2}$	
1347.2†	A	5	0.00	9.16	$1\frac{1}{2}-1\frac{1}{2}$	$3p^5\ ^2P^\circ-4s\ ^2P$ (2)
1351.7	A	3	0.11	9.24	$\frac{1}{2}-\frac{1}{2}$	
1335.8	A	2	0.00	9.24	$1\frac{1}{2}-\frac{1}{2}$	
1363.5	A	5	0.11	9.16	$\frac{1}{2}-1\frac{1}{2}$	

Cl II

I P 23.70 Anal A List D Dec. 1948

REFERENCE

A See: C. C. Kiess and T. L. de Bruin, J. Research Nat.
Bur. Std. **23**, 443, RP1244 (1939). W L, I, T

Cl II

Cl II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Air						
1071.05†	A	(20)	0.00	11.53	2-2	$3p^4\ ^3P - 3p^5\ ^3P^\circ \dagger$	2564.84	A	20	14.79	19.60	3-3	$3d\ ^3D^\circ - 4p''\ ^3D^\dagger$
1071.76	A	(10)	0.09	11.60	1-1	(1)	2565.29	A	15	14.79	19.60	2-2	(8)
1063.83	A	(10)	0.00	11.60	2-1								
1079.08	A	(15)	0.09	11.53	1-2		2251.50	A	40	14.79	20.27	3-2	$3d\ ^3D^\circ - 1$
							2250.96	A	20	14.79	20.27	2-2	(9)
888.07	A	(4)	0.00	13.90	2-1	$3p^4\ ^3P - 4s\ ^3S^\circ$	2253.16	A	30	14.79	20.27	1-2	
893.56	A	(3)	0.09	13.90	1-1	(2)							
895.95	A	(3)	0.12	13.90	0-1								
864.67	A	(5)	0.00	14.28	2-1	$3p^4\ ^3P - 3p^5\ ^1P^\circ$	2502.75	A	40	15.89	20.82	3-2	$4p\ ^5P - 6s\ ^5S^\circ$
872.00	A	(0)	0.12	14.28	0-1	(3)	2498.53	A	30	15.88	20.82	2-2	(10)
							2496.04	A	20	15.88	20.82	1-2	
834.67	A	(10)	0.00	14.79	2-3	$3p^4\ ^3P - 3d\ ^3D^\circ \dagger$							
839.63	A	(2)	0.09	14.79	1-2	(4)	*2434.10	A	50	15.89	20.96	3-4	$4p\ ^5P - 5d\ ^5D^\circ$
841.41	A	(4)	0.12	14.79	0-1		*2430.16	A	30	15.88	20.96	2-3	(11)
							2427.79	A	20	15.88	20.96	1-2	
788.75	A	(4)	0.00	15.65	2-3	$3p^4\ ^3P - 4s'\ ^3D^\circ$	*2434.10	A	50	15.89	20.96	3-3	
793.34	A	(3)	0.09	15.65	1-2	(5)	*2430.16	A	30	15.88	20.96	2-2	
795.36	A	(2)	0.12	15.64	0-1								
789.01	A	(7)	0.00	15.65	2-2								
793.47	A	(3)	0.09	15.64	1-1								
Air													
2688.04	A	150	13.90	18.49	1-2	$4s\ ^3S^\circ - 4p'\ ^3P$	*2667.36	A	40	16.27	20.89	2-1	$4p\ ^3P - 6s\ ^3S^\circ$
2676.95	A	100	13.90	18.51	1-1	(6)	2666.46	A	20	16.27	20.89	1-1	(12)
2672.19	A	50	13.90	18.52	1-0		*2667.36	A	40	16.27	20.89	0-1	
							2549.85	A	50	16.27	21.11	2-3	$4p\ ^3P - 5d\ ^3D^\circ$
							2546.94	A	20	16.27	21.11	1-2	(13)
							2544.84	A	15	16.27	21.12	0-1	
							2547.76	A	12	16.27	21.11	2-2	
							2543.98	A	10	16.27	21.12	1-1	
2658.74	A	100	14.28	18.92	1-2	$3p^5\ ^1P^\circ - 4p'\ ^1D$							
						(7)							
							2906.25	A	20	17.96	22.20	1-1	$4p'\ ^1P - 4d'\ ^1P^\circ$
													(14)

Strongest Unclassified Lines of Cl II

2912.06	A	15					2459.86	A	10				
2763.88	A	10					2452.30	A	10				
2754.10	A	25					2445.34	A	20				
2648.19	A	10					2424.01	A	10				
2615.13	A	10					2412.48	A	10				

Cl III

I P 39.7 Anal B List C Nov. 1947

REFERENCES

A I. S. Bowen, Phys. Rev. **31**, 34 (1928). W L, I, T
B I. S. Bowen, Phys. Rev. **45**, 401 (1934). W L, I, T

Cl III

Cl III

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Air						
1015. 023	A	7	0. 00	12. 16	$1\frac{1}{2}-2\frac{1}{2}$	$3p^3\ ^4S^\circ-3p^4\ ^4P$	2519. 45	A	5	24. 98	29. 88	$3\frac{1}{2}-3\frac{1}{2}$	$4p\ ^4D^\circ-4d\ ^4D^\dagger$
1008. 777	A	6	0. 00	12. 24	$1\frac{1}{2}-1\frac{1}{2}$	(1)	2504. 23	A	5	24. 91	29. 84	$2\frac{1}{2}-2\frac{1}{2}$	(13)
1005. 280	A	5	0. 00	12. 28	$1\frac{1}{2}-\frac{1}{2}$		2484. 27	A	4	24. 85	29. 82	$1\frac{1}{2}-1\frac{1}{2}$	
572. 693	A	4	0. 00	21. 56	$1\frac{1}{2}-2\frac{1}{2}$	$3p^3\ ^4S^\circ-4s\ ^4P$	2469. 20	B	5	24. 82	29. 82	$\frac{1}{2}-\frac{1}{2}$	
574. 408	A	3	0. 00	21. 49	$1\frac{1}{2}-1\frac{1}{2}$	(2)	2510. 92	A	4	24. 91	29. 82	$2\frac{1}{2}-1\frac{1}{2}$	
575. 582	A	3	0. 00	21. 45	$1\frac{1}{2}-\frac{1}{2}$		2471. 07	B	5	24. 98	29. 98	$3\frac{1}{2}-2\frac{1}{2}$	$4p\ ^4D^\circ-4d\ ^4P^\dagger$
557. 118	B	7	0. 00	22. 16	$1\frac{1}{2}-2\frac{1}{2}$	$3p^3\ ^4S^\circ-3d\ ^4P$	2419. 5	B	5	24. 91	30. 01	$2\frac{1}{2}-1\frac{1}{2}$	(14)
556. 605	B	7	0. 00	22. 18	$1\frac{1}{2}-1\frac{1}{2}$	(3)	2394. 73	B	5	24. 85	30. 01	$1\frac{1}{2}-1\frac{1}{2}$	
556. 232	B	6	0. 00	22. 19	$1\frac{1}{2}-\frac{1}{2}$		2283. 93	A	7	24. 98	30. 39	$3\frac{1}{2}-2\frac{1}{2}$	$4p\ ^4D^\circ-5s\ ^4P^\dagger$
606. 345	B	5	2. 24	22. 60	$2\frac{1}{2}-2\frac{1}{2}$	$3p^3\ ^2D^\circ-3d\ ^2D^\dagger$	2291. 38	A	4	24. 91	30. 29	$2\frac{1}{2}-1\frac{1}{2}$	(15)
609. 673	B	4	2. 23	22. 48	$1\frac{1}{2}-1\frac{1}{2}$	(4)	2253. 07	A	7	24. 91	30. 39	$2\frac{1}{2}-2\frac{1}{2}$	
561. 680	B	7	2. 24	24. 22	$2\frac{1}{2}-3\frac{1}{2}$	$3p^3\ ^2D^\circ-3d'\ ^2F$	2268. 95	A	5	24. 85	30. 29	$1\frac{1}{2}-1\frac{1}{2}$	
561. 530	B	7	2. 23	24. 21	$1\frac{1}{2}-2\frac{1}{2}$	(5)	2278. 34	A	5	24. 82	30. 24	$\frac{1}{2}-\frac{1}{2}$	
561. 738	B	7	2. 24	24. 21	$2\frac{1}{2}-2\frac{1}{2}$		2665. 54	A	6	25. 25	29. 88	$2\frac{1}{2}-3\frac{1}{2}$	$4p\ ^4P^\circ-4d\ ^4D^\dagger$
591. 428	B	4	3. 69	24. 56	$1\frac{1}{2}-1\frac{1}{2}$	$3p^3\ ^2P^\circ-3d'\ ^2P^\dagger$	2661. 65	A	5	25. 20	29. 84	$1\frac{1}{2}-2\frac{1}{2}$	(16)
591. 646	B	4	3. 68	24. 55	$\frac{1}{2}-\frac{1}{2}$	(6)	2403. 32	A	5	25. 25	30. 39	$2\frac{1}{2}-2\frac{1}{2}$	$4p\ ^4P^\circ-5s\ ^4P$
1822. 50	B	6	18. 21	24. 98	$4\frac{1}{2}-3\frac{1}{2}$	$3d\ ^4F-4p\ ^4D^\circ^\dagger$	2422. 47	A	4	25. 20	30. 29	$1\frac{1}{2}-1\frac{1}{2}$	(17)
1828. 40	B	5	18. 16	24. 91	$3\frac{1}{2}-2\frac{1}{2}$	(7)	2442. 47	A	5	25. 19	30. 24	$\frac{1}{2}-\frac{1}{2}$	
1832. 08	B	4	18. 12	24. 85	$2\frac{1}{2}-1\frac{1}{2}$		2447. 14	A	6	25. 25	30. 29	$2\frac{1}{2}-1\frac{1}{2}$	
1833. 31	B	4	18. 09	24. 82	$1\frac{1}{2}-\frac{1}{2}$		2448. 58	A	6	25. 20	30. 24	$1\frac{1}{2}-\frac{1}{2}$	
1808. 51	B	4	18. 16	24. 98	$3\frac{1}{2}-3\frac{1}{2}$		2379. 47	A	5	25. 20	30. 39	$1\frac{1}{2}-2\frac{1}{2}$	
1817. 73	B	4	18. 12	24. 91	$2\frac{1}{2}-2\frac{1}{2}$		2416. 42	A	7	25. 19	30. 29	$\frac{1}{2}-1\frac{1}{2}$	
1901. 61	B	5	18. 76	25. 25	$3\frac{1}{2}-2\frac{1}{2}$	$3d\ ^4D-4p\ ^4P^\circ^\dagger$	2580. 67	B	6	25. 42	30. 21	$2\frac{1}{2}-3\frac{1}{2}$	$4p\ ^2D^\circ-4d\ ^2F^\dagger$
1912. 90	B	4	18. 75	25. 20	$2\frac{1}{2}-1\frac{1}{2}$	(8)	2577. 13	B	5	25. 31	30. 10	$1\frac{1}{2}-2\frac{1}{2}$	(18)
1917. 87	B	4	18. 75	25. 19	$1\frac{1}{2}-\frac{1}{2}$		2340. 64	B	6	25. 42	30. 70	$2\frac{1}{2}-2\frac{1}{2}$	$4p\ ^2D^\circ-4d\ ^2D^\dagger$
Air							*2298. 51	B	5	25. 31	30. 68	$1\frac{1}{2}-1\frac{1}{2}$	(19)
2578. 26	B	5	22. 11	26. 89	$1\frac{1}{2}-2\frac{1}{2}$	$4s\ ^2P-4p'\ ^2D^\circ^\dagger$	2710. 37	B	7	25. 42	29. 98	$1\frac{1}{2}-2\frac{1}{2}$	$4p\ ^4S^\circ-4d\ ^4P^\dagger$
2528. 08	B	5	22. 02	26. 90	$\frac{1}{2}-1\frac{1}{2}$	(9)	*2691. 52	B	5	25. 42	30. 01	$1\frac{1}{2}-1\frac{1}{2}$	(20)
2323. 50	B	6	22. 11	27. 42	$1\frac{1}{2}-1\frac{1}{2}$	$4s\ ^2P-4p'\ ^2P^\circ^\dagger$	2486. 91	A	5	25. 42	30. 39	$1\frac{1}{2}-2\frac{1}{2}$	$4p\ ^4S^\circ-5s\ ^4P^\dagger$
*2298. 51	B	5	22. 02	27. 39	$\frac{1}{2}-\frac{1}{2}$	(10)	2532. 48	B	5	25. 82	30. 70	$1\frac{1}{2}-2\frac{1}{2}$	$4p\ ^2P^\circ-4d\ ^2D^\dagger$
2336. 45	B	5	22. 11	27. 39	$1\frac{1}{2}-\frac{1}{2}$		2531. 76	B	5	25. 81	30. 68	$\frac{1}{2}-1\frac{1}{2}$	(22)
2965. 56	B	6	23. 26	27. 42	$2\frac{1}{2}-1\frac{1}{2}$	$4s'\ ^2D-4p'\ ^2P^\circ$	2632. 67	B	5	26. 75	31. 44	$3\frac{1}{2}-2\frac{1}{2}$	$4p'\ ^2F^\circ-4d'\ ^2D$
2991. 82	B	5	23. 26	27. 39	$1\frac{1}{2}-\frac{1}{2}$	(11)	2624. 71	B	3	26. 73	31. 43	$2\frac{1}{2}-1\frac{1}{2}$	(23)
2970. 67	B	4	23. 26	27. 42	$1\frac{1}{2}-1\frac{1}{2}$		2620. 05	B	4	26. 73	31. 44	$2\frac{1}{2}-2\frac{1}{2}$	
2616. 97	B	4	24. 98	29. 70	$3\frac{1}{2}-4\frac{1}{2}$	$4p\ ^4D^\circ-4d\ ^4F^\dagger$	2370. 37	B	6	26. 75	31. 96	$3\frac{1}{2}-2\frac{1}{2}$	$4p'\ ^2F^\circ-5s'\ ^2D$
2609. 50	B	4	24. 91	29. 64	$2\frac{1}{2}-3\frac{1}{2}$	(12)	2359. 67	B	6	26. 73	31. 96	$2\frac{1}{2}-1\frac{1}{2}$	(24)
2603. 59	B	5	24. 85	29. 59	$1\frac{1}{2}-2\frac{1}{2}$		2684. 76	B	5	26. 89	30. 21	$2\frac{1}{2}-3\frac{1}{2}$	$4p'\ ^2D^\circ-4d\ ^2F^\dagger$
2601. 16	B	4	24. 82	29. 57	$\frac{1}{2}-1\frac{1}{2}$		2685. 40	B	4	26. 90	30. 10	$1\frac{1}{2}-2\frac{1}{2}$	(25)
2651. 19	B	3	24. 98	29. 64	$3\frac{1}{2}-3\frac{1}{2}$		2436. 1	B	5	26. 89	31. 96	$2\frac{1}{2}-2\frac{1}{2}$	$4p'\ ^2D^\circ-5s'\ ^2D$
2633. 18	B	5	24. 91	29. 59	$2\frac{1}{2}-2\frac{1}{2}$		2439. 69	B	5	26. 90	31. 96	$1\frac{1}{2}-1\frac{1}{2}$	(26)
2618. 78	B	4	24. 85	29. 57	$1\frac{1}{2}-1\frac{1}{2}$								

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A I

I P 15.69 Anal A List D April 1948

REFERENCES

- A J. C. Boyce, Phys. Rev. **48**, 396 (1935). W L, I, T
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A I

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac 1066.660	A	15	0.00	11.57	0-1	$3p^6 \text{ } ^1\text{S}-4s \text{ } [1\frac{1}{2}]^\circ$ (1)
1048.218†	A	25	0.00	11.78	0-1	$3p^6 \text{ } ^1\text{S}-4s' \text{ } [\frac{1}{2}]^\circ$ (2)
894.30	A	4	0.00	13.80	0-1	$3p^6 \text{ } ^1\text{S}-3d \text{ } [\frac{1}{2}]^\circ$ (3)
876.06	A	4	0.00	14.09	0-1	$3p^6 \text{ } ^1\text{S}-3d \text{ } [1\frac{1}{2}]^\circ$ (4)

A II

I P 27.5 Anal B List C April 1948

REFERENCES

- A J. C. Boyce, Phys. Rev. **48**, 397 (1935). W L, I, T
 B A. H. Rosenthal, Ann. der Phys. [5] **4**, 49 (1930). W L, I
 See C. E. Moore, *Atomic Energy Levels*, Circ. Nat. Bur. Std. 467, Vol. I, p. 216 (1949). T

A II

A II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
919. 78†	A	15	0. 00	13. 42	1½— ½	3p ⁵ 2P°—3p ⁶ 2S	573. 360	A	6	0. 00	21. 53	1½—1½	3p ⁵ 2P°—3d' 2P
932. 046	A	10	0. 18	13. 42	½— ½	(1)	576. 731	A	5	0. 18	21. 58	½— ½	(11)
							572. 015	A	5	0. 00	21. 58	1½— ½	
754. 817	A	3	0. 00	16. 35	1½—2½	3p ⁵ 2P°—3d 4D	578. 107	A	4	0. 18	21. 53	½—1½	
762. 192	A	2	0. 18	16. 37	½—1½	(2)							
							519. 326	A	6	0. 00	23. 77	1½—2½	3p ⁵ 2P°—4d 2D†
744. 920	A	5	0. 00	16. 57	1½—2½	3p ⁵ 2P°—4s 4P†	522. 791	A	4	0. 18	23. 79	½—1½	(12)
748. 193	A	4	0. 18	16. 68	½—1½	(3)							
740. 263	A	12	0. 00	16. 68	1½—1½								
745. 318	A	5	0. 18	16. 74	½— ½								
							1941. 062	A	2	13. 42	19. 78	½—1½	3p ⁵ 2S—4p 2P°
723. 353	A	14	0. 00	17. 07	1½—1½	3p ⁵ 2P°—4s 2P	1961. 356	A	2	13. 42	19. 72	½— ½	(13)
725. 542	A	9	0. 18	17. 19	½— ½	(4)							
718. 083	A	4	0. 00	17. 19	1½— ½		1574. 985	A	4	13. 42	21. 26	½—1½	3p ⁵ 2S—4p' 2P°
730. 929	A	8	0. 18	17. 07	½—1½		1560. 188	A	3	13. 42	21. 33	½— ½	(14)
698. 760	A	4	0. 00	17. 67	1½—2½	3p ⁵ 2P°—3d 4F†							
704. 516	A	3	0. 18	17. 70	½—1½	(5)							
							Air						
671. 854	A	10	0. 00	18. 37	1½—2½	3p ⁵ 2P°—4s' 2D	2942. 90	B	8	17. 07	21. 26	1½—1½	4s 2P—4p' 2P°
679. 410	A	8	0. 18	18. 35	½—1½	(6)	2979. 05	B	6	17. 19	21. 33	½— ½	(15)
672. 849	A	3	0. 00	18. 35	1½—1½		2891. 61	B	5	17. 07	21. 33	1½— ½	
							3033. 52	B	6	17. 19	21. 26	½—1½	
666. 014	A	10	0. 00	18. 54	1½—2½	3p ⁵ 2P°—3d 2F							
						(7)							
661. 868	A	15	0. 00	18. 65	1½—2½	3p ⁵ 2P°—3d 2D	2844. 12	B	2	17. 07	21. 41	1½—2½	4s 2P—4p' 2D°
670. 947	A	10	0. 18	18. 58	½—1½	(8)	2932. 60	B	4	17. 19	21. 40	½—1½	(16)
664. 558	A	6	0. 00	18. 58	1½—1½		2847. 81	B	2	17. 07	21. 40	1½—1½	
597. 695	A	5	0. 00	20. 65	1½— ½	3p ⁵ 2P°—4s'' 2S	2806. 16	B	5	19. 78	24. 18	1½—2½	4p 2P°—5s' 2D
602. 854	A	4	0. 18	20. 65	½— ½	(9)	2764. 66	B	3	19. 72	24. 18	½—1½	(17)
580. 261	A	8	0. 00	21. 27	1½—2½	3p ⁵ 2P°—3d' 2D	2534. 74	B	5	19. 78	24. 65	1½—2½	4p 2P°—4d' 2D
583. 437	A	8	0. 18	21. 34	½—1½	(10)	2510. 63	B	0	19. 72	24. 63	½—1½	(18)
578. 605	A	4	0. 00	21. 34	1½—1½		2544. 72	B	5	19. 78	24. 63	1½—1½	

A III

I P 40.8 Anal C List D Feb. 1948

REFERENCES

- A J. C. Boyce, Phys. Rev. **48**, 396 (1935). W L, I, T
 B T. L. de Bruin, *Zeeman Verhandelingen*, p. 415 (Martinus Nyhoff, The Hague, 1935). W L, I, T
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A III

A III

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
878. 728	A	12	0. 00	14. 05	2-2	$3p^4\ ^3P - 3p^5\ ^3P^{\circ}$	1669. 671	A	7	17. 89	25. 28	4-3	$3d\ ^5D^{\circ} - 4p\ ^5P^{\dagger}$
879. 622	A	8	0. 14	14. 17	1-1	(1)	1673. 425	A	7	17. 89	25. 26	3-2	(6)
871. 099	A	10	0. 00	14. 17	2-1		1675. 637	A	4	17. 89	25. 25	2-1	
875. 534	A	9	0. 14	14. 24	1-0								
887. 404	A	10	0. 14	14. 05	1-2								
883. 179	A	9	0. 19	14. 17	0-1								
690. 170	A	8d	0. 00	17. 89	2-	$3p^4\ ^3P - 3d\ ^5D^{\circ}\dagger$	1914. 398	A	9	19. 37	25. 82	3-2	$3d\ ^3D^{\circ} - 4p\ ^3P^{\dagger}$
695. 537	A	6	0. 14	17. 89	1-	(2)	1915. 564	A	7	19. 37	25. 82	2-1	(7)
637. 282	A	20	0. 00	19. 37	2-3	$3p^4\ ^3P - 3d\ ^3D^{\circ}$	Air						
641. 808	A	12	0. 14	19. 37	1-2	(3)	2484. 11	B	6	23. 01	27. 98	4-4	$3d'\ ^3F^{\circ} - 4p'\ ^3F^{\dagger}$
643. 256	A	9	0. 19	19. 39	0-1		2508. 91	B	3	23. 04	27. 96	3-3	(8)
*637. 282	A	20	0. 00	19. 37	2-2		2533. 92	B	3	23. 07	27. 94	2-2	
641. 364	A	5	0. 14	19. 39	1-1								
636. 818	A	3	0. 00	19. 39	2-1								
553. 470	A	9	0. 00	22. 30	2-1	$3p^4\ ^3P - 4s\ ^3S^{\circ}$	2724. 84	B	10	23. 30	27. 83	3-3	$3d'\ ^3D^{\circ} - 4p'\ ^3D^{\dagger}$
556. 893	A	6	0. 14	22. 30	1-1	(4)	2678. 38	B	9	23. 19	27. 79	2-2	(9)
558. 321	A	5	0. 19	22. 30	0-1		2631. 90	B	7	23. 11	27. 80	1-1	
							2345. 17	B	9	23. 30	28. 56	3-2	$3d'\ ^3D^{\circ} - 4p'\ ^3P^{\dagger}$
							2282. 21	B	7	23. 19	28. 59	2-1	(10)
769. 152	A	12	1. 73	17. 78	2-1	$3p^4\ ^1D - 3p^5\ ^1P^{\circ}$	2242. 29	B	6	23. 11	28. 61	1-0	
						(5)							

A IV

I P 59.6 Anal C List D Nov. 1947

REFERENCES

- A J. C. Boyce, Phys. Rev. **48**, 401 (1935). W L, I, T
 B T. L. de Bruin, *Physica* **3**, No. 8, 809 (1936). W L, I, T

A IV

A IV

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Air						
850. 602	A	25	0. 00	14. 51	$1\frac{1}{2}-2\frac{1}{2}$	$3p^3\ ^1S^\circ-3p^4\ ^4P$	2809. 44	B	16	31. 11	35. 50	$2\frac{1}{2}-3\frac{1}{2}$	$4s\ ^4P-4p\ ^4D^\circ\uparrow$
843. 772	A	20	0. 00	14. 63	$1\frac{1}{2}-1\frac{1}{2}$	(1)	2788. 96	B	14	30. 97	35. 40	$1\frac{1}{2}-2\frac{1}{2}$	(4)
840. 029	A	15	0. 00	14. 70	$1\frac{1}{2}-\frac{1}{2}$		2776. 26	B	10	30. 89	35. 33	$\frac{1}{2}-1\frac{1}{2}$	
							2640. 34	B	15	31. 11	35. 78	$2\frac{1}{2}-2\frac{1}{2}$	$4s\ ^4P-4p\ ^4P^\circ\uparrow$
801. 409	A	10	2. 62	18. 02	$2\frac{1}{2}-2\frac{1}{2}$	$3p^3\ ^2D^\circ-3p^4\ ^2D^\dagger$	2608. 06	B	10	30. 97	35. 71	$1\frac{1}{2}-1\frac{1}{2}$	(5)
801. 086	A	10	2. 60	18. 01	$1\frac{1}{2}-1\frac{1}{2}$	(2)							
*689. 007	A	12	2. 62	20. 54	$2\frac{1}{2}-1\frac{1}{2}$	$3p^3\ ^2D^\circ-3p^4\ ^2P$	2757. 92	B	14	33. 10	37. 58	$2\frac{1}{2}-3\frac{1}{2}$	$4s'\ ^2D-4p'\ ^2F^\circ\uparrow$
683. 278	A	10	2. 60	20. 67	$1\frac{1}{2}-\frac{1}{2}$	(3)	2784. 47	B	12	33. 11	37. 54	$1\frac{1}{2}-2\frac{1}{2}$	(6)

A V

I P 75 Anal C List B Oct. 1947

REFERENCE

A L. W. Phillips and W. L. Parker, Phys. Rev. **60**, 301 (1941). W L, I, T

A v

A v

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
834. 878	A	4b	0. 25	15. 04	2-3	$3p^2\ ^3P-3p^3\ ^3D^\circ\uparrow$	449. 065	A	18	0. 25	27. 74	2-3	$3p^2\ ^3P-3d\ ^3D^\circ\uparrow$
827. 055	A	5	0. 09	15. 02	1-2	(1)	446. 949	A	8	0. 09	27. 72	1-2	(5)
822. 159	A	4	0. 00	15. 02	0-1		445. 997	A	5	0. 00	27. 68	0-1	
715. 645	A	3	0. 25	17. 50	2-2	$3p^2\ ^3P-3p^3\ ^3P^\circ$	337. 998	A	6	0. 25	36. 77	2-2	$3p^3\ ^3P-4s\ ^3P^\circ\uparrow$
*709. 195	A	5	0. 09	17. 50	1-	(2)							(6)
715. 599	A	4	0. 25	17. 50	2-1								
705. 353	A	3	0. 00	17. 50	0-1								
527. 693	A	6	0. 25	23. 65	2-1	$3p^2\ ^3P-3p^3\ ^3S^\circ$	558. 481	A	5	2. 01	24. 12	2-1	$3p^2\ ^1D-3p^3\ ^1P^\circ$
524. 189	A	5	0. 09	23. 65	1-1	(3)							(7)
522. 090	A	3	0. 00	23. 65	0-1		350. 878	A	3	2. 01	37. 20	2-1	$3p^2\ ^1D-4s\ ^1P^\circ$
463. 938	A	7	0. 25	26. 86	2-2	$3p^2\ ^3P-3d\ ^3P^\circ\uparrow$							(8)
459. 728	A	1	0. 09	26. 95	1-1	(4)							
462. 415	A	3	0. 25	26. 95	2-1								
461. 227	A	6b	0. 09	26. 86	1-2								

POTASSIUM

K I

I P 4.32 Anal A List D May 1948

REFERENCES

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W L, T
A. Fowler, *Report on Series in Line Spectra*, p. 102 (Fleetway Press, London, 1922). W L, I, T

K I

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air						
3217. 151	A	6R	0. 00	3. 84	$\frac{1}{2}-1\frac{1}{2}$	$4s\ ^2S-7p\ ^2P^{\circ}$
3217. 615	A	4R	0. 00	3. 84	$\frac{1}{2}-\frac{1}{2}$	(1)
3101. 791	A	4R	0. 00	3. 98	$\frac{1}{2}-1\frac{1}{2}$	$4s\ ^2S-8p\ ^2P^{\circ}$
3102. 051	A	2R	0. 00	3. 98	$\frac{1}{2}-\frac{1}{2}$	(2)
3034. 751	A	} 4R	{ 0. 00	4. 07	$\frac{1}{2}-1\frac{1}{2}$	$4s\ ^2S-9p\ ^2P^{\circ}$
3034. 911	A		{ 0. 00	4. 07	$\frac{1}{2}-\frac{1}{2}$	(3)
2992. 108	A	} 2R	{ 0. 00	4. 12	$\frac{1}{2}-1\frac{1}{2}$	$4s\ ^2S-10p\ ^2P^{\circ}$
2992. 215	A		{ 0. 00	4. 12	$\frac{1}{2}-\frac{1}{2}$	(4)
2963. 203	A	} 1R	{ 0. 00	4. 16	$\frac{1}{2}-1\frac{1}{2}$	$4s\ ^2S-11p\ ^2P^{\circ}$
2963. 277	A		{ 0. 00	4. 16	$\frac{1}{2}-\frac{1}{2}$	(5)
2942. 661	A	} 1R	{ 0. 00	4. 19	$\frac{1}{2}-1\frac{1}{2}$	$4s\ ^2S-12p\ ^2P^{\circ}$
2942. 713	A		{ 0. 00	4. 19	$\frac{1}{2}-\frac{1}{2}$	(6)

K II

I P 31.7 Anal C List B May 1948

REFERENCES

- A I. S. Bowen, Phys. Rev. **31**, 497 (1928). W L, I, T
B T. L. de Bruin, Zeit. Phys. **38**, 94 (1926). W L, I, T

K II

K II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac 612. 61	A	4	0. 00	20. 15	0—1	$3p^6 \ ^1S - 4s \ [1\frac{1}{2}]^\circ$ (1)	Air 2777. 89	B	2	22. 62	27. 06	1—2	$4p \ [\frac{1}{2}] - 4d \ [2\frac{1}{2}]^\circ$ (4)
600. 75†	A	5	0. 00	20. 55	0—1	$3p^6 \ ^1S - 4s' \ [\frac{1}{2}]^\circ$ (2)	2504. 60	B	3	22. 62	27. 54	1—1	$4p \ [\frac{1}{2}] - 4d' \ [1\frac{1}{2}]^\circ$ (5)
607. 90	A	5	0. 00	20. 31	0—1	$3p^6 \ ^1S - 3d \ [\frac{1}{2}]^\circ$ (3)	2743. 55	B	4	23. 05	27. 54	2—1	$4p \ [2\frac{1}{2}] - 4d' \ [1\frac{1}{2}]^\circ$ (6)
							2808. 99	B	3	23. 15	27. 54	1—1	$4p \ [1\frac{1}{2}] - 4d' \ [1\frac{1}{2}]^\circ$ (7)
Strongest Unclassified Lines of K II													
2550. 02	B	6					2342. 30	B	3				

K III

I P 46 Anal C List D Jan. 1948

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K III

K III

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac 765. 644 778. 528	A A	6 7	0. 00 0. 27	16. 12 16. 12	$1\frac{1}{2} - \frac{1}{2}$ $\frac{1}{2} - \frac{1}{2}$	$3p^5 \ ^2P^\circ - 3p^6 \ ^2S$ (1)	Air 2992. 24 3052. 07 3056. 84	B B B	(6) (6) (5)	25. 61 25. 76 25. 86	29. 73 29. 81 29. 90	$2\frac{1}{2} - 3\frac{1}{2}$ $1\frac{1}{2} - 2\frac{1}{2}$ $\frac{1}{2} - 1\frac{1}{2}$	$4s \ ^4P - 4p \ ^4D^\circ$ (7)
520. 611 529. 796 523. 792	A A A	10 8 5	0. 00 0. 27 0. 00	23. 71 23. 57 23. 57	$1\frac{1}{2} - 2\frac{1}{2}$ $\frac{1}{2} - 1\frac{1}{2}$ $1\frac{1}{2} - 1\frac{1}{2}$	$3p^5 \ ^2P^\circ - 3d \ ^2D$ (2)	2938. 45 2986. 20	B B	(5) (5)	25. 61 25. 76	29. 81 29. 90	$2\frac{1}{2} - 2\frac{1}{2}$ $1\frac{1}{2} - 1\frac{1}{2}$	
497. 104	A	15	0. 00	24. 83	$1\frac{1}{2} - 2\frac{1}{2}$	$3p^5 \ ^2P^\circ - 3d \ ^2F$ (3)	2550. 02 2635. 11 2689. 90	B B B	(6) (5) (5)	25. 61 25. 76 25. 86	30. 45 30. 45 30. 45	$2\frac{1}{2} - 1\frac{1}{2}$ $1\frac{1}{2} - 1\frac{1}{2}$ $\frac{1}{2} - 1\frac{1}{2}$	$4s \ ^4P - 4p \ ^4S^\circ$ (8)
470. 089 471. 569 466. 793 474. 920	A A A A	20 15 15 9	0. 00 0. 27 0. 00 0. 27	26. 26 26. 45 26. 45 26. 26	$1\frac{1}{2} - 1\frac{1}{2}$ $\frac{1}{2} - \frac{1}{2}$ $1\frac{1}{2} - \frac{1}{2}$ $\frac{1}{2} - 1\frac{1}{2}$	$3p^5 \ ^2P^\circ - 4s \ ^2P$ (4)							
444. 344 448. 595	A A	15 15	0. 00 0. 27	27. 78 27. 79	$1\frac{1}{2} - 2\frac{1}{2}$ $\frac{1}{2} - 1\frac{1}{2}$	$3p^5 \ ^2P^\circ - 4s' \ ^2D$ (5)							
413. 792	A	10	0. 00	29. 83	$1\frac{1}{2} - \frac{1}{2}$	$3p^5 \ ^2P^\circ - 4s'' \ ^2S$ (6)							

CALCIUM

Ca I

I P 6.09 Anal A List B June 1948

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Ca I

Ca I

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air 2734. 82	C		0. 00	4. 51	0—1	$4s^2\ ^1S - 5p\ ^3P^{\circ}$ (1)	Air 2150. 78	B	1	0. 00	5. 74	0—1	$4s^2\ ^1S - 8p\ ^1P^{\circ}$ (8)
2721. 645	A	10	0. 00	4. 53	0—1	$4s^2\ ^1S - 4p'\ ^1P^{\circ}$ (2)	2770. 79	C	3hv	1. 89	6. 34	2—3	$4p\ ^3P^{\circ} - 4d'\ ^3D$ (9)
2617. 66	C	3	0. 00	4. 71	0—1	$4s^2\ ^1S - 4p'\ ^3D^{\circ}?$ (3)	2764. 60	C	2hv	1. 88	6. 34	1—2	
2541. 40	C	0	0. 00	4. 86	0—1	$4s^2\ ^1S - 4p'\ ^3P^{\circ}$ (4)	2762. 05	C	2	1. 87	6. 34	0—1	
2398. 559	A	2	0. 00	5. 15	0—1	$4s^2\ ^1S - 5p\ ^1P^{\circ}$ (5)	2772. 80	C	1	1. 89	6. 34	2—2	
2275. 471	A	1	0. 00	5. 42	0—1	$4s^2\ ^1S - 6p\ ^1P^{\circ}$ (6)	2766. 13	C	1	1. 88	6. 34	1—1	
2200. 728	A	1	0. 00	5. 61	0—1	$4s^2\ ^1S - 7p\ ^1P^{\circ}$ (7)	2757. 40	C	2h	1. 89	6. 37	2—1	$4p\ ^3P^{\circ} - 4d'\ ^3S$ (10)
							2749. 34	C	1h	1. 88	6. 37	1—1	
							2745. 49	C	1h	1. 87	6. 37	0—1	
							2564. 09	C	3	1. 89	6. 70	2—2	$4p\ ^3P^{\circ} - 4d'\ ^3P$ (11)
							2558. 20	C	2	1. 88	6. 70	1—1	
							2565. 20	C	2	1. 89	6. 70	2—1	
							2558. 60	C	2	1. 88	6. 70	1—0	
							2557. 18	C	2	1. 88	6. 70	1—2	
							2554. 82	C	2	1. 87	6. 70	0—1	

Ca II

I P 11.82 Anal A List B May 1948

REFERENCES

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Ca II

Ca II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac 1649.96 1652.02	A A	2 1	0.00 0.00	7.48 7.47	$\frac{1}{2}-1\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$4s\ ^2S - 5p\ ^2P^\circ$ (1)	Vac 1434.3 1433.1	A A		1.69 1.69	10.30 10.30	$2\frac{1}{2}-$ $1\frac{1}{2}-2\frac{1}{2}$	$3d\ ^2D - 6f\ ^2F^\circ$ (7)
1342.07	A	1	0.00	9.20	$\frac{1}{2}-1\frac{1}{2}$	$4s\ ^2S - 6p\ ^2P^\circ$ (2)							
Air 2131.43 2132.25 2128.733	A A B	2 1 0	1.69 1.69 1.69	7.48 7.47 7.48	$2\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$3d\ ^2D - 5p\ ^2P^\circ$ (3)	Air 2208.606 2197.791	A A	3 2	3.14 3.11	8.73 8.73	$1\frac{1}{2}-\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$4p\ ^2P^\circ - 6s\ ^2S$ (8)
							2112.763 2103.239 2113.19	A A A	2 2 1	3.14 3.11 3.14	8.98 8.98 8.98	$1\frac{1}{2}-2\frac{1}{2}$ $\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$4p\ ^2P^\circ - 5d\ ^2D$ (9)
Vac 1840.21 1838.08	A A		1.69 1.69	8.40 8.40	$2\frac{1}{2}-$ $1\frac{1}{2}-2\frac{1}{2}$	$3d\ ^2D - 4f\ ^2F^\circ$ (4)	Vac 1851.10 1843.6	A A	2 1	3.14 3.11	9.81 9.81	$1\frac{1}{2}-\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$4p\ ^2P^\circ - 7s\ ^2S$ (10)
1644.25	A	0	1.69	9.20		$3d\ ^2D - 6p\ ^2P^\circ$ (5)	1815.04 1807.74	A A	1 1	3.14 3.11	9.94 9.94	$1\frac{1}{2}-2\frac{1}{2}$ $\frac{1}{2}-1\frac{1}{2}$	$4p\ ^2P^\circ - 6d\ ^2D$ (11)
1555.1 1553.5	A A		1.69 1.69	9.63 9.63	$2\frac{1}{2}-$ $1\frac{1}{2}-2\frac{1}{2}$	$3d\ ^2D - 5f\ ^2F^\circ$ (6)							

Ca III

I P 51.00 Anal C List C May 1948

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Ca III

Ca III

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac 490.56	A	2	0.00	25.16	0-1	$3p^6\ ^1S - 3d\ [\frac{1}{2}]^\circ$ (1)	Air 2620.82	B	6	30.11	34.82	1-0	$4s\ [1\frac{1}{2}]^\circ - 4p\ [\frac{1}{2}]$ (9)
409.948	A	5	0.00	30.11	0-1	$3p^6\ ^1S - 4s\ [1\frac{1}{2}]^\circ$ (2)	2541.49 2634.17	B B	6 6	29.94 30.11	34.80 34.80	2-2 1-2	$4s\ [1\frac{1}{2}]^\circ - 4p' [1\frac{1}{2}]$ (10)
403.734	A	5	0.00	30.58	0-1	$3p^6\ ^1S - 4s' [\frac{1}{2}]^\circ$ (3)	2924.33 2813.88 2989.30	B B B	8 7 6	30.58 30.32 30.58	34.80 34.71 34.71	1-2 0-1 1-1	$4s' [\frac{1}{2}]^\circ - 4p' [1\frac{1}{2}]$ (11)
1562.50	A	6	26.34	34.24	3-2	$3d\ [3\frac{1}{2}]^\circ - 4p\ [2\frac{1}{2}]$ (4)	2866.57 2704.87	B B	7 6	30.58 30.32	34.88 34.88	1-1 0-1	$4s' [\frac{1}{2}]^\circ - 4p' [\frac{1}{2}]$ (12)
1870.28	A	6	28.20	34.80	3-2	$3d\ [2\frac{1}{2}]^\circ - 4p' [1\frac{1}{2}]$ (5)	Vac 1943.12	A	6	33.60	39.95	1-2	$4p\ [\frac{1}{2}] - 4d\ [1\frac{1}{2}]^\circ$ (13)
1854.72	A	6	27.88	34.53	2-2	$3d' [2\frac{1}{2}]^\circ - 4p\ [1\frac{1}{2}]$ (6)	Air 2152.47	A	6	34.53	40.27	2-3	$4p\ [1\frac{1}{2}] - 4d\ [3\frac{1}{2}]^\circ$ (14)
Air 2899.78 2988.61 2869.95	B B B	9 7 7	29.94 30.11 29.94	34.20 34.24 34.24	2-3 1-2 2-2	$4s\ [1\frac{1}{2}]^\circ - 4p\ [2\frac{1}{2}]$ (7)	2129.20	A	6	34.71	40.50	1-2	$4p' [1\frac{1}{2}] - 4d\ [2\frac{1}{2}]^\circ$ (15)
2687.78 2881.80 2791.63	B B B	8 7 6	29.94 30.11 30.11	34.53 34.40 34.53	2-2 1-1 1-2	$4s\ [1\frac{1}{2}]^\circ - 4p\ [1\frac{1}{2}]$ (8)	2140.39	A	6	34.80	40.56	2-1	$4p' [1\frac{1}{2}] - 5s\ [1\frac{1}{2}]^\circ$ (16)

SCANDIUM

Sc I

I P 6.53 Anal A List A Nov. 1948

REFERENCE

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Sc I

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air						
2711. 36	A	2	0. 02	4. 57	$2\frac{1}{2}-2\frac{1}{2}$	$\alpha^2D-w^2D^\circ$
2706. 78	A	2	0. 00	4. 56	$1\frac{1}{2}-1\frac{1}{2}$	(1)
2707. 95	A	1	0. 02	4. 58	$2\frac{1}{2}-1\frac{1}{2}$	$\alpha^2D-w^2P^\circ$
2692. 78	A	1	0. 00	4. 58	$1\frac{1}{2}-\frac{1}{2}$	(2)

Sc II

I P 12.8 Anal A List C June 1948

REFERENCES

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Sc II

Sc II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air							Air						
2552. 38	A	10e	0. 02	4. 86	3-2	$\alpha^2D-y^3P^\circ\uparrow$	2611. 23	A	3e	3. 22	7. 95	2-2	$z^1D^\circ-f^1D$
2560. 26	A	9e	0. 01	4. 83	2-1	(1)							(3)
2563. 23	A	8e	0. 00	4. 81	1-0		2801. 35	A	6e	3. 44	7. 84	4-4	$z^3F^\circ-e^3F\uparrow$
2545. 24	A	5e	0. 01	4. 86	2-2		2789. 20	A	5e	3. 41	7. 83	3-3	(4)
2555. 84	A	6e	0. 00	4. 83	1-1		2782. 34	A	3e	3. 39	7. 82	2-2	
2273. 10	B	3	1. 45	6. 88	0-1	$\alpha^1S-y^1P^\circ$	2826. 69	A	10e	3. 48	7. 84	3-4	$z^3D^\circ-e^3F\uparrow$
						(2)	2822. 17	A	7e	3. 46	7. 83	2-3	(5)
							2819. 56	A	5e	3. 45	7. 82	1-2	

Sc III

I P 24.65 Anal C List A Nov. 1948

REFERENCES

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Sc III

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac 1603. 12 1610. 25 1598. 06	A A A	10 8 5	0. 02 0. 00 0. 00	7. 72 7. 67 7. 72	$2\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$3d\ ^2D-4p\ ^2P^\circ$ (1)
731. 66 730. 60	A A	1 0	0. 02 0. 00	16. 90 16. 90	$2\frac{1}{2}-3\frac{1}{2}$ $1\frac{1}{2}-2\frac{1}{2}$	$3d\ ^2D-4f\ ^2F^\circ$ (2)

Air 2699. 01 2734. 02	B B	(3) (2)	3. 15 3. 15	7. 72 7. 67	$\frac{1}{2}-1\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$4s\ ^2S-4p\ ^2P^\circ$ (3)

2010. 48 Vac 1993. 96 Air 2012. 30	A A A	6 4 1	7. 72 7. 67 7. 72	13. 86 13. 86 13. 86	$1\frac{1}{2}-2\frac{1}{2}$ $\frac{1}{2}-1\frac{1}{2}$ $1\frac{1}{2}-1\frac{1}{2}$	$4p\ ^2P^\circ-4d\ ^2D$ (4)
Vac 1912. 48 1895. 33	C C	(2) (2)	7. 72 7. 67	14. 18 14. 18	$1\frac{1}{2}-\frac{1}{2}$ $\frac{1}{2}-\frac{1}{2}$	$4p\ ^2P^\circ-5s\ ^2S$ (5)

Sc IV

I P 73.6 Anal E List A Nov. 1948

REFERENCES

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Sc IV

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac 298. 428	A	8	0. 00	4. 14	0-1	$3p^6\ ^1S-4s\ [1\frac{1}{2}]^\circ$ (1)
293. 248	A	8	0. 00	4. 21	0-1	$3p^6\ ^1S-4s'\ [\frac{1}{2}]^\circ$ (2)
217. 189	A	0	0. 00	5. 68	0-1	$3p^6\ ^1S-5s\ [1\frac{1}{2}]^\circ$ (3)
215. 522	A	2	0. 00	5. 73	0-1	$3p^6\ ^1S-5s'\ [\frac{1}{2}]^\circ$ (4)

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Ti I

I P 6.81 Anal A List B Sept. 1948

REFERENCES

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 P Predicted wavelength. W L

Ti I

Ti I

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air							Air						
2956.133	A	70R	0.05	4.22	4-4	$a^3F - v^3F^\circ$	2541.917	G	20	0.05	4.90	4-3	$a^3F - s^3D^\circ$
2948.255	A	60r	0.02	4.21	3-3	(1)	2529.866	L	(4)	0.02	4.90	3-2	(8)
*2941.995§	A	60r	0.00	4.19	2-2		2520.543	G	10	0.00	4.90	2-1	
2967.220	F	25	0.05	4.21	4-3		2527.991	G	5	0.02	4.90	3-3	
2956.796	F	25	0.02	4.19	3-2		2519.01	K	(4)	0.00	4.90	2-2	
2937.301	F	25	0.02	4.22	3-4		2517.14	H	(1)	0.00	4.90	2-3	
2933.526	F	25	0.00	4.21	2-3								
							2470.93	H	(3)	0.05	5.04	4-3	$a^3F - r^3D^\circ$
2679.949	G	20	0.05	4.65	4-5	$a^3F - v^3G^\circ$	2468.360	G	2	0.02	5.02	3-2	(9)
2669.610	G	15	0.02	4.64	3-4	(2)	2464.966	G	2	0.00	5.01	2-1	
2661.966	L	10	0.00	4.64	2-3		2457.80	H	(2)	0.02	5.04	3-3	
2685.14	H	(3)	0.05	4.64	4-4		2458.00	H	(2)	0.00	5.02	2-2	
							2440.98	G	10	0.05	5.10	4-5	$a^3F - u^3G^\circ$
2669.274	G	2	0.02	4.64	3-3	$a^3F - x^1F^\circ$	2433.23	G	6	0.02	5.09	3-4	(10)
2657.186	G	10	0.00	4.64	2-3	(3)	2428.24	G	2	0.00	5.08	2-3	
							2446.12	H	(2)	0.05	5.09	4-4	
2668.36	H	(1)	0.05	4.67	4-4	$a^3F - u^3F^\circ$	2438.28	H	(2)	0.02	5.08	3-3	
2660.66	H	(1)	0.02	4.66	3-3	(4)							
2654.928	G	5	0.00	4.65	2-2		2424.26	G	10	0.05	5.14	4-4	$a^3F - s^3F^\circ$
2676.09	H	(1)	0.05	4.66	4-3		2421.31	G	10	0.02	5.12	3-3	(11)
2653.02	H	(2)	0.02	4.67	3-4		2418.37	G	10	0.00	5.10	2-2	
2648.65	H	(1)	0.00	4.66	2-3		2434.09	G	3	0.05	5.12	4-3	
							2428.36	K	(2)	0.02	5.10	3-2	
2646.650	G	40	0.05	4.71	4-3	$a^3F - u^3D^\circ$	2411.58	K	(3)	0.02	5.14	3-4	
2644.275	G	40	0.02	4.69	3-2	(5)	2411.37	G	2	0.00	5.12	2-3	
2641.116	G	40	0.00	4.67	2-1								
2631.55	J	(1)	0.02	4.71	3-3		2384.52	G	4	0.05	5.22	4-3	$a^3F - q^3D^\circ$
2632.424	G	15	0.00	4.69	2-2		2378.15	G	3	0.02	5.21	3-2	(12)
							2371.95	K	(2)	0.00	5.20	2-1	
2611.287	G	25	0.05	4.77	4-4	$a^3F - t^3F^\circ$	2372.23	K	(1)	0.02	5.22	3-3	
2605.163	G	25	0.02	4.76	3-3	(6)	*2368.57	K	(2)	0.00	5.21	2-2	
2599.910	G	25	0.00	4.75	2-2								
2619.942	G	10	0.05	4.76	4-3		2380.80	K	(4)	0.05	5.23	4-3	$a^3F - p^3D^\circ$
2611.468	G	8	0.02	4.75	3-2		2374.59	K	(3)	0.02	5.22	3-2	(13)
2596.596	G	10	0.02	4.77	3-4		2369.29	K	(2)	0.00	5.21	2-1	
2593.647	L	(3)	0.00	4.76	2-3		*2368.57	K	(2)	0.02	5.23	3-3	
							2365.05	K	(1)	0.00	5.22	2-2	
2604.88	H	(3)	0.05	4.79	4-3	$a^3F - t^3D^\circ$	2305.69	G	12	0.05	5.40	4-4	$a^3F - r^3F^\circ$
2594.63	H	(2)	0.02	4.78	3-2	(7)	2302.75	G	10	0.02	5.38	3-3	(14)
2586.26	H	(3)	0.00	4.77	2-1		2299.86	G	10	0.00	5.37	2-2	
2590.265	G	5	0.02	4.79	3-3		2314.27	K	(2)	0.05	5.38	4-3	
2583.224	G	2	0.00	4.78	2-2		2308.88	K	(2)	0.02	5.37	3-2	
2578.91	H	(2)	0.00	4.79	2-3		2294.24	G	3	0.02	5.40	3-4	
							2293.78	G	3	0.00	5.38	2-3	

Ti I—Continued

Ti I—Continued

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air							Air						
2280.00	G	12	0.05	5.46	4-3	$a^3F - o^3D^\circ$	2742.30	J	15	0.90	5.40	2-2	$a^1D - v^1D^\circ$
2276.75	G	10	0.02	5.44	3-2	(15)							(25)
2273.33	G	8	0.00	5.43	2-1		2735.613	G	6	0.90	5.41	2-2	$a^1D - u^1D^\circ$
2268.78	K	(4)	0.02	5.46	3-3								(26)
2267.98	K	(4)	0.00	5.44	2-2								
2260.08	K	(1)	0.00	5.46	2-3								
2272.65	G	8	0.05	5.48	4-5	$a^3F - t^3G^\circ$	2965.72	G	15	1.06	5.22	2-3	$a^3P - q^3D^\circ$
2272.45	K	(1)	0.02	5.45	3-4	(16)	2965.231	L	(5)	1.05	5.21	1-2	(27)
*2238.73	K	(8)	0.05	5.56	4-4	$a^3F - g^3F^\circ$	2965.681	F	8	1.04	5.20	0-1	
2233.79	K	(8)	0.02	5.55	3-3	(17)	2974.926	F	4	1.06	5.21	2-2	
2230.18	K	(7)	0.00	5.53	2-2		2970.552	F	4	1.05	5.20	1-1	
2244.69	K	(7)	0.05	5.55	4-3?		2980.28	G	tr	1.06	5.20	2-1	
*2238.73	K	(8)	0.02	5.53	3-2		2959.98	G	5	1.06	5.23	2-3	$a^3P - p^3D^\circ$
2227.91	K	(1)	0.02	5.56	3-4		2959.71	G	3	1.05	5.22	1-2	(28)
2230.48	K	(7)	0.05	5.58	4-3	$a^3F - n^3D^\circ$	2961.48	G	2	1.04	5.21	0-1	
2226.77	K	(6)	0.02	5.56	3-2	(18)	2969.37	G	1	1.06	5.22	2-2	
2223.19	K	(7)	0.00	5.55	2-1		2966.38	G	1	1.05	5.21	1-1	
2219.75	K	(5)	0.02	5.58	3-3		2805.680	F	6	1.06	5.46	2-3	$a^3P - o^3D^\circ$
2218.38	K	(5)	0.00	5.56	2-2		2809.150	F	5	1.05	5.44	1-2	(29)
2211.36	K	(1)	0.00	5.58	2-3		2812.963	F	2	1.04	5.43	0-1	
							*2817.83§	K	2	1.06	5.44	2-2	
							2817.37	K	(3)	1.05	5.43	1-1	
2836.09	G	1	0.84	5.20	5-4	$a^5F - v^5D^\circ$	2757.397	L	6	1.06	5.54	2-1	$a^3P - w^3S^\circ$
*2836.60§	G	1	0.83	5.18	4-3	(19)	2749.062	L	5	1.05	5.54	1-1	(30)
2836.40	G	1n	0.82	5.17	3-2		2744.846	G	5	1.04	5.54	0-1	
2835.63	G	2	0.81	5.17	2-1								
2834.75	G	2	0.81	5.16	1-0		2731.145	G	4	1.06	5.58	2-3	$a^3P - n^3D^\circ$
*2828.05	G	2	0.83	5.20	4-4		m2733.56	P	Fe II	1.05	5.56	1-2	(31)
2830.03	G	2n	0.82	5.18	3-3		2736.71	H	(2)	1.04	5.55	0-1	
2831.40	G	1n	0.81	5.17	2-2		2741.82	H	(1)	1.06	5.56	2-2	
2832.26	G	1n	0.81	5.17	1-1		2740.88	H	(2)	1.05	5.55	1-1	
2821.51	G	1	0.82	5.20	3-4		2733.265	G	30	1.06	5.58	2-2	$a^3P - t^3P^\circ$
2825.06	G	1	0.81	5.18	2-3		2731.592	G	7	1.05	5.57	1-1	(32)
*2828.05	G	2	0.81	5.17	1-2		2739.804	G	15	1.06	5.57	2-1	
							2735.298	G	10	1.05	5.56	1-0	
							2725.084	G	10	1.05	5.58	1-2	
2976.32	G	2	0.90	5.04	2-3	$a^1D - r^3D^\circ$	2727.416	L	8	1.04	5.57	0-1	
2991.79	G	1	0.90	5.02	2-2	(20)							
2947.72	G	3	0.90	5.08	2-3	$a^1D - u^3G^\circ$	2990.48	G	3	1.45	5.58	4-3	$b^3F - n^3D^\circ$
						(21)	2990.98	G	3	1.44	5.56	3-2	(33)
2922.92	G	2	0.90	5.12	2-3	$a^1D - s^3F^\circ$	2990.03	G	3	1.42	5.55	2-1	
						(22)							
2912.072	F	40	0.90	5.13	2-3	$a^1D - v^1F^\circ$	2928.320	F	30	1.50	5.71	4-4	$a^1G - u^1G^\circ$
						(23)							(34)
2802.465	F	15	0.90	5.30	2-1	$a^1D - w^1P^\circ$	2758.061	G	20	1.50	5.97	4-3	$a^1G - u^1F^\circ$
						(24)							(35)

Strongest Unclassified Lines of Ti I

2905.649	F	5	IVA			2246.14	G	4					
2892.77	H	[3]	[IVA]			2238.20	K	(6)					
2688.820	G	10				2229.67	K	(7)					
2684.812	G	5				2225.11	K	(8)					
2656.920	G	4				2143.52	K	(6)					
2656.376	G	4				2142.05	K	(5)					
2649.597	G	3				2139.41	K	(5)					
2649.306	G	4				2126.89	K	(5)					
2580.809	G	5				2123.50	K	(7)					
2504.522	G	3				2121.90	K	(6)					
2264.07	G	5				2117.01	K	(6)					

Ti II

I P 13.6 Anal A List B Sept. 1948

REFERENCES

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 E H. N. Russell, *Mt. Wilson Contr. No. 344*; *Astroph. J.* **66**, 283 (1927). W L, (I), T
 F F. Exner and E. Haschek, See H. Kayser, *Handbuch der Spectroscopie* **6**, 655 (1912). W L, (I)
 G A. S. King, *Mt. Wilson Contr. No. 274*; *Astroph. J.* **59**, 155 (1924). W L
 H R. J. Lang, unpublished material. W L, (I)
 I C. E. Moore, unpublished material. W L, I
 J K. Behner, *Zeit. Wiss. Ptg.* **23**, 325 (1925). W L
 P Predicted wavelength. W L

Ti II

Ti II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air													
2909.912	D	7	0.05	4.29	4½-4½	a 4F - z 2G°†	2498.94	F	(2)	0.60	5.54	3½-2½	a 2F - x 2D°
2913.08	I	1	0.03	4.26	3½-3½	(1)	2481.49	F	(1)	0.57	5.54	2½-1½	(10)
2474.22	F	(2)	0.05	5.04	4½-3½	a 4F - y 4D°†	2054.54	E	(3)	0.60	6.61	3½-2½	a 2F - w 2D°
2477.21	F	(2)	0.03	5.01	3½-2½	(2)	2041.49	E	(3)	0.57	6.62	2½-1½	(11)
2478.64	F	(5)	0.01	4.99	2½-1½		2043.26	E	tr	0.57	6.61	2½-2½	
Vac													
1914.32	P		0.05	6.50	4½-3½	a 4F - x 4D°							
1914.11	H	(00)	0.03	6.48	3½-2½	(3)	2764.821	J	10	1.08	5.54	2½-2½	a 2D - x 2D°
1909.74	H	(2)	0.01	6.48	2½-1½		2761.291	J	7	1.08	5.54	1½-1½	(12)
1911.01	H	(0)	0.00	6.46	1½-½		2762.22	F	2	1.08	5.54	1½-2½	
1908.29	H	(3)	0.03	6.50	3½-3½		2716.20	F	4	1.08	5.62	2½-1½	a 2D - y 2P°
1909.33	H	(2)	0.01	6.48	2½-2½		2719.39	F	2	1.08	5.61	1½-½	(13)
1906.30	H	(3)	0.00	6.48	1½-1½		2713.76	F	(1)	1.08	5.62	1½-1½	
Air													
2525.619	J	30	0.15	5.04	4½-3½	b 4F - y 4D°							
2531.266	J	20	0.13	5.01	3½-2½	(4)	2884.099	D	70	1.13	5.40	4½-4½	a 2G - y 2G°
2534.640	J	20	0.12	4.99	2½-1½		2877.418	D	60	1.11	5.40	3½-3½	(14)
2535.881	J	10	0.11	4.98	1½-½		2887.456	D	2	1.13	5.40	4½-3½	
2517.448	J	2	0.13	5.04	3½-3½		2874.08	E	2	1.11	5.40	3½-4½	
2524.655	J	8	0.12	5.01	2½-2½								
2529.74	P		0.11	4.99	1½-1½		2717.304	J	3	1.13	5.67	4½-5½	a 2G - z 2H°
2510.90	F	2	0.12	5.04	2½-3½		2725.79	F	3	1.11	5.64	3½-4½	(15)
2519.79	F	0	0.11	5.01	1½-2½								
2891.050	D	15	0.60	4.87	3½-2½	a 2F - y 2D°							
2888.923	D	15	0.57	4.84	2½-1½	(5)	2862.34	F	30	1.23	5.54	1½-2½	a 2P - x 2D°
2868.732	D	15	0.57	4.87	2½-2½		2851.087	D	20	1.22	5.54	½-1½	(16)
							2861.291	D	3	1.23	5.54	1½-1½	
2858.399	D	8	0.57	4.89	2½-1½	a 2F - z 2P°	2806.407	D	5	1.22	5.61	½-½	a 2P - y 2P°
						(6)							(17)
2841.914	D	30	0.60	4.95	3½-3½	a 2F - y 2F°							
2832.158	D	20	0.57	4.93	2½-2½	(7)							
2853.922	D	10	0.60	4.93	3½-2½								
2820.36	E	4	0.57	4.95	2½-3½								
2784.648	J	3	0.60	5.04	3½-3½	a 2F - y 4D°	2346.35	F	(1)	1.24	6.50	2½-3½	b 4P - x 4D°
2780.55	F	5n	0.57	5.01	2½-2½	(8)	2349.97	F	(3)	1.23	6.48	1½-2½	(18)
2763.90	F	(1)	0.57	5.04	2½-3½		2347.46	F	(2)	1.22	6.48	½-1½	
							2355.17	F	(2)	1.24	6.48	2½-2½	
2571.036	J	20	0.60	5.40	3½-4½	a 2F - y 2G°	2350.67	F	(2)	1.23	6.48	1½-1½	
2555.988	J	10	0.57	5.40	2½-3½	(9)	2354.61	F	(1)	1.22	6.46	½-½	
2573.72	F	0	0.60	5.40	3½-3½		2355.86	F	(1)	1.24	6.48	2½-1½	
							2357.82	F	(2)	1.23	6.46	1½-½	

Ti III

I P 28.02 Anal C List C Sept. 1948

REFERENCE

A H. N. Russell and R. J. Lang, Mt. Wilson Contr. No. 337; Astroph. J. **66**, 13 (1927). W L, I, T

Ti III

Ti III

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Air						
*1298.67	A	50	0.05	9.56	4-3	$a^3F-z^3D^{\circ}$	2563.42	A	15	4.74	9.56	3-3	$a^3D-z^3D^{\circ}\dagger$
1298.95	A	40	0.02	9.53	3-2	(1)	2565.42	A	8	4.72	9.53	2-2	(6)
*1298.67	A	50	0.00	9.51	2-1		2567.53	A	8	4.70	9.51	1-1	
*1294.67	A	50	0.02	9.56	3-3		2580.43	A	5	4.74	9.53	3-2	
1295.91	A	30	0.00	9.53	2-2		2576.43	A	5	4.72	9.51	2-1	
1286.38	A	40	0.05	9.65	4-4	$a^3F-z^3F^{\circ}$	2516.01	A	20	4.74	9.65	3-4	$a^3D-z^3F^{\circ}\dagger$
1289.32	A	30	0.02	9.60	3-3	(2)	2527.80	A	15	4.72	9.60	2-3	(7)
1291.64	A	20	0.00	9.56	2-2		2540.02	A	15	4.70	9.56	1-2	
1293.26	A	30	0.05	9.60	4-3								
*1294.67	A	50	0.02	9.56	3-2								
1282.49	A	3	0.02	9.65	3-4								
1498.65	A	30	1.05	9.28	2-2	$a^1D-z^1D^{\circ}$	2984.76	A	10	5.15	9.28	2-2	$b^1D-z^1D^{\circ}$
						(3)	2413.97	A	15	5.15	10.26	2-3	$b^1D-z^1F^{\circ}$
1327.60	A	15	1.05	10.34	2-1	$a^1D-z^1P^{\circ}$	2375.02	A	6	5.15	10.34	2-1	$b^1D-z^1P^{\circ}$
						(4)							(10)
1455.22	A	40	1.78	10.26	4-3	$a^1G-z^1F^{\circ}$							
						(5)							

Ti IV

I P 43.06 Anal C List D Sept. 1948

REFERENCE

A H. N. Russell and R. J. Lang, Mt. Wilson Contr. No. 337; Astroph. J. **66**, 18 (1927). W L, I, T

Ti IV

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac						
779.14	A	20	0.05	15.89	$2\frac{1}{2}-1\frac{1}{2}$	$3d^2D-4p^2P^{\circ}$
781.78	A	20	0.00	15.79	$1\frac{1}{2}-\frac{1}{2}$	(1)
776.82	A	10	0.00	15.89	$1\frac{1}{2}-1\frac{1}{2}$	
Air						
2067.50	A	15	9.92	15.89	$\frac{1}{2}-1\frac{1}{2}$	$4s^2S-4p^2P^{\circ}$
2103.08	A	10	9.92	15.79	$\frac{1}{2}-\frac{1}{2}$	(2)
Vac						
1467.25	A	30	15.89	24.30	$1\frac{1}{2}-2\frac{1}{2}$	$4p^2P^{\circ}-4d^2D$
1451.75	A	30	15.79	24.29	$\frac{1}{2}-1\frac{1}{2}$	(3)
1469.21	A	15	15.89	24.29	$1\frac{1}{2}-1\frac{1}{2}$	
Air						
2546.85	A	12	24.30	29.15	$2\frac{1}{2}-3\frac{1}{2}$	$4d^2D-4f^2F^{\circ}\dagger$
2541.75	A	8	24.29	29.15	$1\frac{1}{2}-2\frac{1}{2}$	(4)

VANADIUM

VI

I P 6.71 Anal A List B Sept. 1948

REFERENCES

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 W L, I, T
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 H C. E. Moore, Phys. Rev. **55**, 710 (1939) and Ref. A. W L, (I), T

VI

VI

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air							Air						
2977. 550	D	25r	0. 07	1. 35	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F -w^4D^\circ \dagger$	2870. 575	D	35r	0. 07	4. 37	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F -u^4D^\circ$
2962. 784	D	30r	0. 04	1. 30	$3\frac{1}{2}-2\frac{1}{2}$	(1)	2864. 386	D	30r	0. 04	4. 35	$3\frac{1}{2}-2\frac{1}{2}$	(6)
2954. 33	G	20	0. 02	0. 80	$2\frac{1}{2}-1\frac{1}{2}$		2859. 997	D	25	0. 02	4. 33	$2\frac{1}{2}-1\frac{1}{2}$	
2943. 197	D	30r	0. 00	0. 09	$1\frac{1}{2}-\frac{1}{2}$		2855. 252	D	20	0. 00	4. 32	$1\frac{1}{2}-\frac{1}{2}$	
2957. 30	G	10?	0. 04	1. 35	$3\frac{1}{2}-3\frac{1}{2}$		2851. 784	D	20	0. 04	4. 37	$3\frac{1}{2}-3\frac{1}{2}$	
2946. 54	G	15	0. 02	1. 30	$2\frac{1}{2}-2\frac{1}{2}$		2849. 197	H	15	0. 02	4. 35	$2\frac{1}{2}-2\frac{1}{2}$	
2942. 354	D	10	0. 00	0. 80	$1\frac{1}{2}-1\frac{1}{2}$		2848. 807	D	15	0. 00	4. 33	$1\frac{1}{2}-1\frac{1}{2}$	
							2836. 714	D	3	0. 02	4. 37	$2\frac{1}{2}-3\frac{1}{2}$	
2938. 67	G	6	0. 00	4. 20	$1\frac{1}{2}-$	$a^4F - 1^\circ$	2838. 06	G	5	0. 00	4. 35	$1\frac{1}{2}-2\frac{1}{2}$	
						(2)							
2942. 33	G	10	0. 07	4. 26	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F -v^4F^\circ$	*2778. 058	H	4	0. 07	4. 51	$4\frac{1}{2}-4\frac{1}{2}?$	$a^4F -x^2G^\circ$
2935. 880	D	15	0. 04	4. 24	$3\frac{1}{2}-3\frac{1}{2}$	(3)							(7)
*2937. 696	D	15	0. 02	4. 22	$2\frac{1}{2}-2\frac{1}{2}$		*2747. 534§	A	(6)	0. 07	4. 56	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F -w^4G^\circ$
2955. 806	D	15	0. 00	4. 20	$1\frac{1}{2}-1\frac{1}{2}$		2733. 334	A	(8)	0. 04	4. 56	$3\frac{1}{2}-4\frac{1}{2}$	(8)
m2953. 84	P	Fe I	0. 07	4. 24	$4\frac{1}{2}-3\frac{1}{2}$		2725. 062	A	4	0. 02	4. 55	$2\frac{1}{2}-3\frac{1}{2}$	
2949. 62	G	25	0. 04	4. 22	$3\frac{1}{2}-2\frac{1}{2}$								
2922. 582	D	4	0. 02	4. 20	$2\frac{1}{2}-1\frac{1}{2}$		2717. 433	A	3	0. 02	4. 56	$2\frac{1}{2}-3\frac{1}{2}$	$a^4F -x^2F^\circ$
2919. 931	H	6	0. 04	4. 26	$3\frac{1}{2}-4\frac{1}{2}$								(9)
2925. 880	D	4	0. 02	4. 24	$2\frac{1}{2}-3\frac{1}{2}$		2707. 589	A	3	0. 07	4. 63	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F -w^2F^\circ \dagger$
			0. 00	4. 22	$1\frac{1}{2}-2\frac{1}{2}$		2677. 117	A	(4)	0. 00	4. 61	$1\frac{1}{2}-2\frac{1}{2}$	(10)
2926. 258	H	12	0. 04	4. 26	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F -y^2D^\circ$							
2915. 33	G	10	0. 02	4. 25	$2\frac{1}{2}-1\frac{1}{2}$	(4)							
*2910. 435§	H	5?	0. 02	4. 26	$\frac{1}{2}-2\frac{1}{2}$		2670. 918	A	(7)	0. 04	4. 66	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F -w^2D^\circ$
2903. 700	D	12	0. 00	4. 25	$1\frac{1}{2}-1\frac{1}{2}$		2657. 708	A	5	0. 02	4. 66	$2\frac{1}{2}-2\frac{1}{2}$	(11)
2898. 822	D	5	0. 00	4. 26	$1\frac{1}{2}-2\frac{1}{2}$		2668. 894	A	3	0. 00	4. 62	$1\frac{1}{2}-1\frac{1}{2}$	
2923. 627	D	70Ra	0. 07	4. 29	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F -v^4D^\circ \dagger$	2686. 512	A	(10)	0. 07	4. 66	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F -v^4G^\circ$
2914. 924	D	50Ra	0. 04	4. 27	$3\frac{1}{2}-2\frac{1}{2}$	(5)	2678. 674	A	(5)	0. 04	4. 65	$3\frac{1}{2}-4\frac{1}{2}$	(12)
2906. 134	D	40r	0. 02	4. 26	$2\frac{1}{2}-1\frac{1}{2}$		2671. 669	A	(10)	0. 02	4. 64	$2\frac{1}{2}-3\frac{1}{2}$	
2899. 602	D	30	0. 00	4. 26	$1\frac{1}{2}-\frac{1}{2}$		2665. 958	A	(20)	0. 00	4. 63	$1\frac{1}{2}-2\frac{1}{2}$	
2904. 126	D	20	0. 04	4. 29	$3\frac{1}{2}-3\frac{1}{2}$		2695. 235	A	4	0. 07	4. 65	$4\frac{1}{2}-4\frac{1}{2}$	
2899. 207	D	20	0. 02	4. 27	$2\frac{1}{2}-2\frac{1}{2}$		2685. 018	A	5	0. 04	4. 64	$3\frac{1}{2}-3\frac{1}{2}$	
2894. 583	D	8	0. 00	4. 26	$1\frac{1}{2}-1\frac{1}{2}$		*2675. 753	A	(8)	0. 02	4. 63	$2\frac{1}{2}-2\frac{1}{2}$	

V I—Continued

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air						
2661.424	A	(70R)	0.07	4.71	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F - t^4D^\circ \uparrow$ (13)
2656.224	A	(60R)	0.04	4.69	$3\frac{1}{2}-2\frac{1}{2}$	
2651.896	A	(50R)	0.02	4.67	$2\frac{1}{2}-1\frac{1}{2}$	
2647.710	A	(40R)	0.00	4.66	$1\frac{1}{2}-\frac{1}{2}$	
2645.256	A	(10)	0.04	4.71	$3\frac{1}{2}-3\frac{1}{2}$	
2643.14	A	(5)	0.02	4.69	$2\frac{1}{2}-2\frac{1}{2}$	
2642.289	A	(4)	0.00	4.67	$1\frac{1}{2}-1\frac{1}{2}$	
2633.588	A	4	0.00	4.69	$1\frac{1}{2}-2\frac{1}{2}$	
2556.815	A	(6)	0.04	4.87	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - w^4P^\circ \uparrow$ (14)
2556.016	A	(9)	0.02	4.85	$2\frac{1}{2}-1\frac{1}{2}$	
2547.073	A	6	0.00	4.85	$1\frac{1}{2}-1\frac{1}{2}$	
2574.020	A	(50R)	0.07	4.86	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - u^4F^\circ$ (15)
2562.125	A	(60R)	0.04	4.86	$3\frac{1}{2}-3\frac{1}{2}$	
2552.648	A	(50R)	0.02	4.85	$2\frac{1}{2}-2\frac{1}{2}$	
2545.981	A	(30R?)	0.00	4.85	$1\frac{1}{2}-1\frac{1}{2}$	
2577.202	A	(20R?)	0.07	4.86	$4\frac{1}{2}-3\frac{1}{2}$	
*2564.817	A	(40R?)	0.04	4.85	$3\frac{1}{2}-2\frac{1}{2}$	
2554.856	A	(15)	0.02	4.85	$2\frac{1}{2}-1\frac{1}{2}$	
2558.893	A	(15)	0.04	4.86	$3\frac{1}{2}-4\frac{1}{2}$	
2549.965	A	12	0.02	4.86	$2\frac{1}{2}-3\frac{1}{2}$	$a^4F - v^4P^\circ$ (27)
2543.723	A	(20)	0.00	4.85	$1\frac{1}{2}-2\frac{1}{2}$	
2517.500	A	8	0.02	4.92	$2\frac{1}{2}-1\frac{1}{2}$	
2508.822	A	5	0.00	4.92	$1\frac{1}{2}-1\frac{1}{2}$	$a^4F - x^4S^\circ$ (16)
2526.213	A	(100R)	0.07	4.95	$4\frac{1}{2}-3\frac{1}{2}$	
2519.622	A	(100R)	0.04	4.94	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - s^4D^\circ$ (17)
2511.940	A	(100R)	0.02	4.93	$2\frac{1}{2}-1\frac{1}{2}$	
2506.902	A	150R	0.00	4.92	$1\frac{1}{2}-\frac{1}{2}$	
2511.642	A	(80R)	0.04	4.95	$3\frac{1}{2}-3\frac{1}{2}$	
*2507.777	A	(100R)	0.02	4.94	$2\frac{1}{2}-2\frac{1}{2}$	
2503.300	A	(50R)	0.00	4.93	$1\frac{1}{2}-1\frac{1}{2}$	
2499.959	A	8	0.02	4.95	$2\frac{1}{2}-3\frac{1}{2}$	
2499.244	A	(12)	0.00	4.94	$1\frac{1}{2}-2\frac{1}{2}$	
2515.145	A	(30R)	0.02	4.92	$2\frac{1}{2}-1\frac{1}{2}$	$a^4F - v^4D^\circ \uparrow$ (18)
2500.382	A	5	0.02	4.95	$2\frac{1}{2}-2\frac{1}{2}$	
2506.482	A	6	0.00	4.92	$1\frac{1}{2}-1\frac{1}{2}$	
2530.174	A	(80R)	0.07	4.95	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F - u^4G^\circ \uparrow$ (19)
2517.142	A	(80R)	0.04	4.94	$3\frac{1}{2}-4\frac{1}{2}$	
*2507.777	A	(100R)	0.02	4.94	$2\frac{1}{2}-3\frac{1}{2}$	
2501.608	A	(60R)	0.00	4.93	$1\frac{1}{2}-2\frac{1}{2}$	
m2519.55	P	V I	0.04	4.94	$3\frac{1}{2}-3\frac{1}{2}$	
2510.242	A	(8)	0.02	4.93	$2\frac{1}{2}-2\frac{1}{2}$	
2534.206	A	3	0.07	4.94	$4\frac{1}{2}-3\frac{1}{2}$	
2498.232	A	(20h)	0.02	4.96	$2\frac{1}{2}-2\frac{1}{2}$	$a^4F - v^4F^\circ \uparrow$ (20)
2471.443	A	10	0.02	5.01	$2\frac{1}{2}-3\frac{1}{2}$	
2499.094	A	15	0.04	4.98	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - u^4D^\circ$ (21)
2487.528	A	10	0.02	4.98	$2\frac{1}{2}-2\frac{1}{2}$	
2505.540	A	(15)	0.07	4.99	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F - w^4H^\circ \uparrow$ (22)
2495.787	A	20	0.04	4.98	$3\frac{1}{2}-4\frac{1}{2}$	
2488.203	A	5	0.02	4.98	$2\frac{1}{2}-3\frac{1}{2}$	
2435.518	A	(100R)	0.07	5.14	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - t^4F^\circ$ (23)
2428.269	A	(100R)	0.04	5.12	$3\frac{1}{2}-3\frac{1}{2}$	
2421.058	A	(120R)	0.02	5.11	$2\frac{1}{2}-2\frac{1}{2}$	
2415.326	A	(110R)	0.00	5.11	$1\frac{1}{2}-1\frac{1}{2}$	$a^4F - v^4F^\circ \uparrow$ (24)
2441.892	A	(30)	0.07	5.12	$4\frac{1}{2}-3\frac{1}{2}$	
2432.014	A	(25R?)	0.04	5.11	$3\frac{1}{2}-2\frac{1}{2}$	
2423.370	A	40R?	0.02	5.11	$2\frac{1}{2}-1\frac{1}{2}$	$a^4F - s^4G^\circ$ (25)
2421.976	A	(140R)	0.04	5.14	$3\frac{1}{2}-4\frac{1}{2}$	
2417.351	A	(100R)	0.02	5.12	$2\frac{1}{2}-3\frac{1}{2}$	
2413.031	A	(60R)	0.00	5.11	$1\frac{1}{2}-2\frac{1}{2}$	$a^4F - t^4G^\circ$ (26)
2439.102	A	(50R)	0.07	5.13	$4\frac{1}{2}-4\frac{1}{2}$	
2431.568	A	10	0.04	5.12	$3\frac{1}{2}-3\frac{1}{2}$	
2445.224	A	3	0.07	5.12	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F - v^4H^\circ$ (25)
2420.614	A	3	0.02	5.12	$2\frac{1}{2}-3\frac{1}{2}$	
2431.940	A	20R?	0.07	5.14	$4\frac{1}{2}-5\frac{1}{2}$	
2427.735	A	20	0.04	5.12	$3\frac{1}{2}-4\frac{1}{2}$	$a^4F - t^4G^\circ$ (26)
2441.352	A	(15)	0.07	5.12	$4\frac{1}{2}-4\frac{1}{2}$	
2416.748	A	(150R)	0.07	5.17	$4\frac{1}{2}-5\frac{1}{2}$	
2406.748	A	(50R)	0.04	5.17	$3\frac{1}{2}-4\frac{1}{2}$	$a^4F - v^4P^\circ$ (27)
2401.901	A	(60R)	0.02	5.16	$2\frac{1}{2}-3\frac{1}{2}$	
2399.954	A	(50R)	0.00	5.14	$1\frac{1}{2}-2\frac{1}{2}$	
2420.115	A	(100R)	0.07	5.17	$4\frac{1}{2}-4\frac{1}{2}$	
2412.686	A	(80R)	0.04	5.16	$3\frac{1}{2}-3\frac{1}{2}$	
2407.900	A	(40R)	0.02	5.14	$2\frac{1}{2}-2\frac{1}{2}$	
2426.126	A	15	0.07	5.16	$4\frac{1}{2}-3\frac{1}{2}$	
2418.738	A	15	0.04	5.14	$3\frac{1}{2}-2\frac{1}{2}$	
2398.134	A	20	0.04	5.19	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - r^4D^\circ \uparrow$ (28)
2396.706	A	8	0.02	5.17	$2\frac{1}{2}-1\frac{1}{2}$	
2387.475	A	5	0.02	5.19	$2\frac{1}{2}-2\frac{1}{2}$	
*2397.775	A	40h	0.07	5.22	$4\frac{1}{2}-3\frac{1}{2}$	$a^4F - u^4F^\circ \uparrow$ (29)
2390.774	A	30	0.04	5.20	$3\frac{1}{2}-2\frac{1}{2}$	
2388.084	A	35	0.02	5.18	$2\frac{1}{2}-1\frac{1}{2}$	
2384.286	A	20	0.00	5.18	$1\frac{1}{2}-\frac{1}{2}$	
2384.64	A	5	0.04	5.22	$3\frac{1}{2}-3\frac{1}{2}$	
2380.178	A	5	0.02	5.20	$2\frac{1}{2}-2\frac{1}{2}$	
2380.266	A	8	0.00	5.18	$1\frac{1}{2}-1\frac{1}{2}$	
2397.496	A	4	0.04	5.19	$3\frac{1}{2}-3\frac{1}{2}$	
2390.868	A	4	0.02	5.18	$2\frac{1}{2}-2\frac{1}{2}$	$a^4F - s^4F^\circ \uparrow$ (30)
2383.038	A	3	0.00	5.18	$1\frac{1}{2}-2\frac{1}{2}$	
2398.277	A	20h	0.07	5.21	$4\frac{1}{2}-3\frac{1}{2}$	
2340.479	A	(50R)	0.07	5.34	$4\frac{1}{2}-4\frac{1}{2}$	$a^4F - s^4F^\circ$ (31)
2334.434	A	40R	0.04	5.33	$3\frac{1}{2}-3\frac{1}{2}$	
2329.529	A	30	0.02	5.31	$2\frac{1}{2}-2\frac{1}{2}$	
2325.873	A	30	0.00	5.31	$1\frac{1}{2}-1\frac{1}{2}$	
2347.026	A	10	0.07	5.33	$4\frac{1}{2}-3\frac{1}{2}$	
2339.673	A	20	0.04	5.31	$3\frac{1}{2}-2\frac{1}{2}$	
2333.33	A	20	0.02	5.31	$2\frac{1}{2}-1\frac{1}{2}$	
2327.970	A	10	0.04	5.34	$3\frac{1}{2}-4\frac{1}{2}$	
2324.347	A	6	0.02	5.33	$2\frac{1}{2}-3\frac{1}{2}$	$a^4F - g^4D^\circ \uparrow$ (32)
2322.096	A	15	0.00	5.31	$1\frac{1}{2}-2\frac{1}{2}$	
2324.748	A	40	0.07	5.38	$4\frac{1}{2}-3\frac{1}{2}$	
2320.156	A	25	0.04	5.36	$3\frac{1}{2}-2\frac{1}{2}$	$a^4F - x^4F^\circ \uparrow$ (34)
2315.634	A	30	0.02	5.35	$2\frac{1}{2}-1\frac{1}{2}$	
2311.465	A	30	0.00	5.34	$1\frac{1}{2}-\frac{1}{2}$	
2312.410	A	8	0.04	5.38	$3\frac{1}{2}-3\frac{1}{2}$	$a^4F - s^4G^\circ$ (35)
2310.180	A	20	0.02	5.36	$2\frac{1}{2}-2\frac{1}{2}$	
2308.287	A	15	0.00	5.35	$1\frac{1}{2}-1\frac{1}{2}$	
2302.531	A	4	0.02	5.38	$2\frac{1}{2}-3\frac{1}{2}$	$a^4F - t^4F^\circ \uparrow$ (33)
*2295.414	A	4	0.04	5.42	$3\frac{1}{2}-2\frac{1}{2}$	
2299.544	A	3	0.07	5.44	$4\frac{1}{2}-3\frac{1}{2}$	
2291.527	A	10	0.07	5.45	$4\frac{1}{2}-5\frac{1}{2}$	$a^4F - x^4F^\circ \uparrow$ (34)
2283.382	A	10	0.04	5.44	$3\frac{1}{2}-4\frac{1}{2}$	
2276.889	A	6	0.02	5.44	$2\frac{1}{2}-3\frac{1}{2}$	
2272.048	A	4	0.00	5.43	$1\frac{1}{2}-2\frac{1}{2}$	
*2295.414	A	4	0.07	5.44	$4\frac{1}{2}-4\frac{1}{2}$	
2286.581	A	8	0.04	5.44	$3\frac{1}{2}-3\frac{1}{2}$	
2279.152	A	4	0.02	5.43	$2\frac{1}{2}-2\frac{1}{2}$	

V I—Continued

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air						
2439. 102	A	(50r)	0. 07	5. 13	4½—4½	a 4F — t 2G° (24)
2431. 568	A	10	0. 04	5. 12	3½—3½	
2445. 224	A	3	0. 07	5. 12	4½—3½	
2420. 614	A	3	0. 02	5. 12	2½—3½	
2431. 940	A	20r?	0. 07	5. 14	4½—5½	a 4F — v 2H° (25)
2427. 735	A	20	0. 04	5. 12	3½—4½	
2441. 352	A	(15)	0. 07	5. 12	4½—4½	
2416. 748	A	(150R)	0. 07	5. 17	4½—5½	a 4F — t 4G° (26)
2406. 748	A	(50R)	0. 04	5. 17	3½—4½	
2401. 901	A	(60R)	0. 02	5. 16	2½—3½	
2399. 954	A	(50R)	0. 00	5. 14	1½—2½	
2420. 115	A	(100R)	0. 07	5. 17	4½—4½	
2412. 686	A	(80R)	0. 04	5. 16	3½—3½	
2407. 900	A	(40R)	0. 02	5. 14	2½—2½	
2426. 126	A	15	0. 07	5. 16	4½—3½	
2418. 738	A	15	0. 04	5. 14	3½—2½	a 4F — v 4P° (27)
2398. 134	A	20	0. 04	5. 19	3½—2½	
2396. 706	A	8	0. 02	5. 17	2½—1½	
2387. 475	A	5	0. 02	5. 19	2½—2½	
*2397. 775	A	40h	0. 07	5. 22	4½—3½	a 4F — r 4D°† (28)
2390. 774	A	30	0. 04	5. 20	3½—2½	
2388. 084	A	35	0. 02	5. 18	2½—1½	
2384. 286	A	20	0. 00	5. 18	1½—½	
2384. 64	A	5	0. 04	5. 22	3½—3½	
2380. 178	A	5	0. 02	5. 20	2½—2½	
2380. 266	A	8	0. 00	5. 18	1½—1½	
2397. 496	A	4	0. 04	5. 19	3½—3½	a 4F — u 2F°† (29)
2390. 868	A	4	0. 02	5. 18	2½—2½	
2383. 038	A	3	0. 00	5. 18	1½—2½	
2398. 277	A	20h	0. 07	5. 21	4½—3½	a 4F — 2°† (30)
2340. 479	A	(50r)	0. 07	5. 34	4½—4½	a 4F — s 4F° (31)
2334. 434	A	40r	0. 04	5. 33	3½—3½	
2329. 529	A	30	0. 02	5. 31	2½—2½	
2325. 873	A	30	0. 00	5. 31	1½—1½	
2347. 026	A	10	0. 07	5. 33	4½—3½	
2339. 673	A	20	0. 04	5. 31	3½—2½	
2333. 33	A	20	0. 02	5. 31	2½—1½	
2327. 970	A	10	0. 04	5. 34	3½—4½	
2324. 347	A	6	0. 02	5. 33	2½—3½	
2322. 096	A	15	0. 00	5. 31	1½—2½	
2324. 748	A	40	0. 07	5. 38	4½—3½	
2320. 156	A	25	0. 04	5. 36	3½—2½	
2315. 634	A	30	0. 02	5. 35	2½—1½	
2311. 465	A	30	0. 00	5. 34	1½—½	
2312. 410	A	8	0. 04	5. 38	3½—3½	
2310. 180	A	20	0. 02	5. 36	2½—2½	
2308. 287	A	15	0. 00	5. 35	1½—1½	
2302. 531	A	4	0. 02	5. 38	2½—3½?	
*2295. 414	A	4	0. 04	5. 42	3½—2½	a 4F — t 2F°† (33)
2299. 544	A	3	0. 07	5. 44	4½—3½?	a 4F — x 6F°† (34)
2291. 527	A	10	0. 07	5. 45	4½—5½	a 4F — s 4G° (35)
2283. 382	A	10	0. 04	5. 44	3½—4½	
2276. 889	A	6	0. 02	5. 44	2½—3½	
2272. 048	A	4	0. 00	5. 43	1½—2½	
*2295. 414	A	4	0. 07	5. 44	4½—4½?	
2286. 581	A	8	0. 04	5. 44	3½—3½	
2279. 152	A	4	0. 02	5. 43	2½—2½	

V I—Continued

V I—Continued

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)			
			Low	High						Low	High					
Air																
2276.661	A	3	0.07	5.49	4½-4½	a 4F -s 2G°† (36)	2098.50	H	(40)	0.07	5.95	4½-5½	a 4F -q 4G°† (47)			
2264.39	A	30 Fe?	0.07	5.52	4½-3½	a 4F -p 4D° (37)	*2096.19	H	(20)	0.04	5.93	3½-4½	a 4F -o 4F° (48)			
*2256.968§	A	50r	0.04	5.51	3½-2½		*2096.37§	H	(20)	0.02	5.90	2½-3½				
2250.672	A	30r?	0.02	5.50	2½-1½		*2096.19	H	(20)	0.00	5.89	1½-2½				
2245.756	A	30	0.00	5.50	1½-½		2106.33	H	(15)	0.07	5.93	4½-4½				
2252.681	A	5	0.04	5.52	3½-3½		2104.57	H	(15)	0.04	5.90	3½-3½				
2247.520	A	9	0.02	5.51	2½-2½		2102.23	H	(15)	0.02	5.89	2½-2½				
2243.742	A	8h	0.00	5.50	1½-1½	a 4F -r 4F°† (38)	2092.44	A	60r	0.07	5.97	4½-4½	a 4F -n 4D°† (49)			
2241.846	A	40r	0.07	5.57	4½-4½		2090.64	A	20r	0.04	5.94	3½-3½				
2234.680	A	10	0.04	5.56	3½-3½		*2092.30	A	10r	0.02	5.92	2½-2½				
*2225.787	A	10	0.02	5.56	2½-2½		2091.29	A	20r	0.00	5.90	1½-1½				
2222.834	A	15	0.00	5.55	1½-1½		2100.75	A	6	0.07	5.94	4½-3½				
2230.362	A	20	0.04	5.57	3½-4½		2100.51	A	8	0.04	5.92	3½-2½				
2225.422	A	30	0.02	5.56	2½-3½	a 4F -q 4F° (39)	2097.34	A	7	0.02	5.90	2½-1½	a 4F -			
2237.228	A	50r	0.07	5.58	4½-4½		*2082.49	A	20r?	0.04	5.97	3½-4½				
*2229.734§	A	25r?	0.04	5.57	3½-3½		2086.31	A	8	0.02	5.94	2½-3½				
2223.014	A	20	0.02	5.57	2½-2½		2090.96	H	(10)	0.00	5.90	1½-2½				
2218.238	A	25r	0.00	5.56	1½-1½		2085.91	H	(20)	0.00	5.92	1½-2½				
2241.213	A	7	0.07	5.57	4½-3½		2096.72	H	(15)	0.04	5.93	3½-				
2232.252	A	8	0.04	5.57	3½-2½	2088.56	H	(40)	0.02	5.93	2½-	12°				
2225.029	A	8	0.02	5.56	2½-1½	2095.77	H	(25)	0.04	5.93	3½-3½	13°				
*2225.787	A	10	0.04	5.58	3½-4½	2087.62	H	(10)	0.02	5.93	2½-3½	13°				
2216.245	A	4	0.00	5.57	1½-2½	2104.84	H	(20)	0.07	5.93	4½-3½	14°				
2220.450	A	3	0.02	5.57	2½-1½	2094.71	H	(40)	0.04	5.93	3½-3½	14°				
2213.692	A	10	0.00	5.57	1½-1½	*2086.57	H	15nr	0.02	5.93	2½-3½	14°				
2228.835	A	15	0.04	5.58	3½-3½	2085.56	H	(10)	0.02	5.93	2½-2½	15°†				
2219.652	A	3	0.04	5.60	3½-4½	2084.12	H	(10nv)	0.04	5.96	3½-	17°†				
2231.412	A	30	0.07	5.60	4½-5½	a 4F -r 2G°† (41)	2038.85	H	(90)	0.07	6.12	4½-3½	a 4F -n 4D°† (50)			
2158.12	A	(15)	0.00	5.72	1½-		2035.30	H	(80)	0.04	6.10	3½-2½				
2164.88	A	(15)	0.04	5.74	3½-2½		2034.06	H	(90)	0.02	6.08	2½-1½				
*2146.64	A	(10)	0.02	5.77	2½-1½		2032.27	H	(60)	0.00	6.07	1½-½				
2125.84	H	(20)	0.04	5.85	3½-3½		2029.36	H	(50)	0.04	6.12	3½-3½				
*2117.48§	H	(20)	0.02	5.85	2½-3½		2027.62	H	(40)	0.02	6.10	2½-2½				
2124.15	H	(12)	0.07	5.88	4½-3½	2028.42	H	(40)	0.00	6.08	1½-1½	a 4F -				
2102.58	H	(15)	0.02	5.89	2½-	2041.00	H	(60)	0.04	6.09	3½-2½		a 4F -			
2204.930	A	12	0.07	5.67	4½-4½	2008.70	H	(10)	0.04	6.18	3½-			a 4F -t 2D°† (52)		
2200.174	A	15	0.04	5.65	3½-3½	2010.48	H	(20)	0.00	6.14	1½-1½?				a 4F -p 4G°† (53)	
2194.65	A	10	0.02	5.64	2½-2½	Vac										a 4F -n 4F° (54)
2189.95	A	6	0.00	5.64	1½-1½	1984.91	H	(50)	0.07	6.29	4½-5½					
2211.350	A	3	0.07	5.65	4½-3½	1983.37	H	(50)	0.04	6.26	3½-4½					
2203.658	A	4	0.04	5.64	3½-2½	1982.45	H	(40)	0.02	6.24	2½-3½					
2193.82	A	5	0.04	5.67	3½-4½	1982.06	H	(40)	0.00	6.23	1½-2½					
m2191.21	P	V I	0.02	5.65	2½-3½	1989.82	H	(12)	0.04	6.24	3½-3½	a 4F -m 4D° (55)				
2188.06	A	3?	0.00	5.64	1½-2½	1967.98	H	(80r?)	0.07	6.34	4½-4½					
2196.29	A	5	0.02	5.64	2½-1½	1966.52	H	(60)	0.04	6.32	3½-3½					
2202.724	A	60r	0.07	5.67	4½-3½	1965.26	H	(60)	0.02	6.30	2½-2½					
2196.40	A	40r?	0.04	5.66	3½-2½	1964.27	H	(60)	0.00	6.28	1½-1½					
2191.10	A	30	0.02	5.65	2½-1½	1975.42	H	(10)	0.07	6.32	4½-3½					
2187.39	A	10	0.00	5.64	1½-½	1972.48	H	(15)	0.04	6.30	3½-2½					
2191.65	A	3	0.04	5.67	3½-3½	1969.57	H	(15)	0.02	6.28	2½-1½					
2182.22	A	120R	0.07	5.72	4½-5½	1959.12	H	(30)	0.04	6.34	3½-4½					
2177.00	A	100R	0.04	5.71	3½-4½	1959.36	H	(30)	0.02	6.32	2½-3½					
2173.15	A	80R	0.02	5.70	2½-3½	1959.97	H	(40)	0.00	6.30	1½-2½					
2170.74	A	60R	0.00	5.69	1½-2½	1966.76	H	(60)	0.07	6.35	4½-3½					
2187.95	A	15	0.07	5.71	4½-4½	1965.07	H	(60)	0.04	6.32	3½-2½					
2181.97	A	20	0.04	5.70	3½-3½	1963.47	H	(70)	0.02	6.30	2½-1½					
2177.24	A	10	0.02	5.69	2½-2½	1961.69	H	(50)	0.00	6.29	1½-½					
						*1957.90	H	(50)	0.04	6.35	3½-3½					
						1958.18	H	(12)	0.00	6.30	1½-1½					

V I—Continued

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air 2835. 660	D	5	0. 27	4. 63	2½–3½?	$a^4D - w^2F^\circ$ (56)
2618. 908	A	5	0. 27	4. 98	1½–2½	$a^4D - u^2D^\circ$ (57)
2497. 655	A	6h	0. 27	5. 22	2½–3½	$a^4D - r^4D^\circ$ (58)
2480. 606	A	(30h)	0. 30	5. 27	4½–4½?	$a^4D - w^6D^\circ$ (59)
2482. 115	A	(20h)	0. 29	5. 26	3½–3½?	
2489. 13	A	4h	0. 30	5. 26	4½–3½?	$a^4D - x^6F^\circ$ (60)
2488. 737	A	4h	0. 29	5. 24	3½–2½?	
2473. 652	A	5h	0. 29	5. 27	3½–4½?	
2476. 510	A	7h	0. 27	5. 26	2½–3½?	
2478. 97	A	5h	0. 27	5. 24	1½–2½?	
2392. 898	A	40h	0. 30	5. 46	4½–5½	
2386. 409	A	20h	0. 29	5. 46	3½–4½?	$a^4D - s^4G^\circ$ (62)
*2391. 268	A	30h	0. 27	5. 44	2½–3½?	
2395. 429	A	10h	0. 27	5. 43	1½–2½?	
2396. 492	A	15h	0. 26	5. 41	½–1½?	
2395. 104	A	30h	0. 29	5. 44	3½–3½?	
*2397. 775	A	40h	0. 27	5. 43	2½–2½?	
2403. 362	A	5h	0. 27	5. 41	1½–1½?	
2403. 029	A	10h	0. 26	5. 40	½–½?	
2405. 733	A	6	0. 30	5. 44	4½–3½?	
2405. 245	A	10h	0. 27	5. 40	1½–½?	
2398. 697	A	10h	0. 30	5. 43	4½–3½?	$a^4D - x^6P^\circ$ (61)
2394. 270	A	10	0. 29	5. 43	3½–3½?	
*2146. 64	A	(10)	0. 30	5. 45	4½–5½	$a^4D - s^4G^\circ$ (62)
2138. 62	H	(10)	0. 27	5. 43	3½–3½?	
*2092. 30	H	(10r)	0. 29	6. 03	3½–2½	$a^4D -$ (63)
*2086. 57	H	(15nr)	0. 27	6. 04	2½–2½	
2077. 16	H	(15)	0. 29	6. 18	3½–	$a^4D -$ (63)
2012. 35	H	(20)	0. 27	6. 19	2½–2½	
2011. 54	H	(15)	0. 29	6. 23	3½–	$a^4D -$ (63)
			0. 27	6. 40	1½–1½	
			0. 29	6. 42	3½–	$a^4D -$ (63)
3002. 65	G	8	1. 08	5. 19	3½–2½	$a^4D - v^4P^\circ$ (64)
3004. 82	G	10	1. 06	5. 17	2½–1½	
3004. 33	G	4	1. 05	5. 15	1½–½	$a^4D - r^4D^\circ$ (65)
2995. 617	D	4	1. 05	5. 17	1½–1½	
2998. 62	G	4	1. 04	5. 15	½–½	$a^4D - r^4D^\circ$ (65)
2981. 537	H	0	1. 08	5. 22	3½–3½	
2978. 936	D	4	1. 06	5. 20	2½–2½	$a^4D - s^4F^\circ$ (66)
2893. 47	G	4h	1. 08	5. 34	3½–4½	
2869. 484	D	3	1. 08	5. 38	3½–3½	$a^4D - q^4D^\circ$ (67)
*2870. 04	G	5	1. 06	5. 36	2½–2½	
			1. 05	5. 35	1½–1½	$a^4D - u^4P^\circ$ (68)
2866. 971	D	10	1. 08	5. 38	3½–2½	
2862. 418	D	10	1. 06	5. 37	2½–1½	$a^4D - u^4P^\circ$ (68)
2859. 001	D	4h	1. 05	5. 36	1½–½	
*2854. 057	D	4h	1. 05	5. 37	1½–1½	$a^4D - u^4P^\circ$ (68)
2853. 82	G	3h	1. 04	5. 36	½–½	

V I—Continued

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air *2778. 058	H	4	1. 08	5. 52	3½–3½?	$a^4D - p^4D^\circ$ (69)
*2774. 01	G	3	1. 06	5. 51	2½–2½	
*2774. 01	G	3	1. 05	5. 50	1½–½	$a^4D - p^4F^\circ$ (70)
2689. 114	A	3	1. 08	5. 67	3½–4½	
m2688. 71	P	V II	1. 06	5. 65	2½–3½	$a^4D - t^4P^\circ$ (71)
m2686. 49	P	V I	1. 05	5. 64	1½–2½	
m2698. 67	P	V I	1. 08	5. 65	3½–3½	$a^4D - t^4P^\circ$ (71)
2693. 918	A	6	1. 06	5. 64	2½–2½	
2696. 760	A	(6)	1. 06	5. 64	2½–1½	$a^4D - o^4D^\circ$ (72)
2688. 942	A	4	1. 05	5. 64	1½–1½	
2685. 843	A	4	1. 08	5. 67	3½–3½	$a^4D - o^4D^\circ$ (72)
m2683. 08	P	V II	1. 06	5. 66	2½–2½	
*2685. 515	A	4	1. 05	5. 64	1½–½	$a^4D - t^4P^\circ$ (73)
2675. 977	A	4	1. 06	5. 67	2½–3½	
*2675. 753	A	(8)	1. 05	5. 66	1½–2½	$a^4D - t^4P^\circ$ (73)
2676. 636	A	3	1. 04	5. 65	½–1½	
2620. 284	A	(20)	1. 08	5. 79	3½–2½	$a^4D - t^4P^\circ$ (73)
2611. 255	A	8	1. 06	5. 79	2½–1½	
2605. 084	A	4	1. 05	5. 78	1½–½	$a^4P - w^4S^\circ$ (74)
2610. 891	A	6	1. 06	5. 79	2½–2½	
2604. 294	A	5	1. 05	5. 79	1½–1½	$a^4P - w^4S^\circ$ (74)
2600. 798	A	5	1. 04	5. 78	½–½	
3016. 17	G	20	1. 21	5. 30	2½–1½	$a^4P - w^4S^\circ$ (74)
2999. 20	G	12	1. 19	5. 30	1½–1½	
2990. 93	G	8	1. 18	5. 30	½–½	$a^4P - q^4D^\circ$ (75)
2963. 818	D	6	1. 21	5. 38	2½–3½	
*2976. 5278	D	8	1. 21	5. 36	2½–2½	$a^4P - q^4D^\circ$ (75)
2968. 981	D	3	1. 19	5. 35	1½–1½	
2974. 217	H	8	1. 19	5. 34	1½–½	$a^4P - u^4P^\circ$ (76)
2961. 127	D	10	1. 21	5. 38	2½–2½	
2968. 29	G	5	1. 21	5. 37	2½–1½	$a^4P - u^4P^\circ$ (76)
2957. 176	H	8h	1. 19	5. 36	1½–½	
2944. 76	G	10h	1. 19	5. 38	1½–2½	$a^4P - p^4D^\circ$ (77)
2943. 84	G	12h	1. 18	5. 37	½–1½	
2866. 447	D	20	1. 21	5. 52	2½–3½	$a^4P - p^4D^\circ$ (77)
2857. 972	D	20	1. 19	5. 51	1½–2½	
2855. 518	D	6	1. 18	5. 50	½–1½	$a^4P - o^4D^\circ$ (78)
2863. 076	D	12	1. 19	5. 50	1½–1½	
2858. 787	D	10	1. 18	5. 50	½–½	$a^4P - o^4D^\circ$ (78)
2768. 30	G	3	1. 21	5. 67	2½–3½	
2698. 724	A	(40)	1. 21	5. 79	2½–2½	$a^4P - t^4P^\circ$ (79)
*2685. 515	A	4	1. 19	5. 79	1½–1½	
2679. 707	A	5	1. 18	5. 78	½–½	$a^4P - t^4P^\circ$ (79)
2699. 12	A	(20)	1. 21	5. 79	2½–1½	
2686. 356	A	9	1. 19	5. 78	1½–½	$a^4P - t^4P^\circ$ (79)
*2685. 148	A	(15)	1. 19	5. 79	1½–2½	
2678. 878	A	10	1. 18	5. 79	½–1½	$a^4P - n^4D^\circ$ (80)
2514. 41	A	10h	1. 21	6. 12	2½–3½?	

V I—Continued

V I—Continued

I A	Ref	Int	E P		<i>J</i>	Multiplet (No)	I A	Ref	Int	E P		<i>J</i>	Multiplet (No)
			Low	High						Low	High		
Air *2482. 711	A	(15h)	1. 21	6. 18	2½—	<i>a</i> 4P — 23° (81)	Air 2275. 475 2284. 494 2284. 982	A A A	3 20 3	1. 70 1. 70 1. 70	7. 13 7. 13 7. 11	½—½? 1½—½? ½—½?	<i>a</i> 2P — <i>s</i> 2P° (93)
2996. 48 2975. 077	G D	6 8	1. 37 1. 34	5. 49 5. 49	4½—4½ 3½—3½	<i>a</i> 2G — <i>s</i> 2G° (82)	2839. 43	G	4	1. 79	6. 14	1½—1½	<i>a</i> 2D — <i>t</i> 2D°† (94)
2917. 94 2916. 00	G G	8 8	1. 37 1. 34	5. 60 5. 58	4½—4½ 3½—3½	<i>a</i> 2G — <i>r</i> 2G° (83)	2324. 189 2312. 531	A A	10 10	1. 80 1. 79	7. 11 7. 13	2½—1½? 1½—½?	<i>a</i> 2D — <i>s</i> 2P° (95)
2773. 66 2768. 93	G G	8 6	1. 37 1. 34	5. 82 5. 80	4½—3½ 3½—2½	<i>a</i> 2G — <i>s</i> 2F°† (84)	*2854. 057	D	4h	1. 85	6. 17	4½—5½?	<i>a</i> 4H — <i>x</i> 2I° (96)
2731. 347 2722. 560 2738. 075	A A A	(80r?) (60r) 5	1. 37 1. 34 1. 37	5. 89 5. 88 5. 88	4½—5½ 3½—4½ 4½—4½	<i>a</i> 2G — <i>s</i> 2H° (85)	2481. 11	A	10h	1. 84	6. 81	3½—2½	<i>a</i> 4H — 34° (97)
2697. 744 2696. 996 2712. 217	A A A	(50r?) (40r?) 4	1. 37 1. 34 1. 37	5. 95 5. 92 5. 92	4½—4½ 3½—3½ 4½—3½	<i>a</i> 2G — <i>g</i> 2G°† (86)	2868. 130 2866. 620	D D	20 15	1. 88 1. 86	6. 19 6. 17	5½—6½ 4½—5½	<i>a</i> 2H — <i>x</i> 2I° (98)
2534. 825	A	15h	1. 37	6. 24	4½—3½	<i>a</i> 2G — <i>r</i> 2F°† (87)	2652. 919 2653. 824	A A	(20) (25)	1. 88 1. 86	6. 54 6. 51	5½—4½ 4½—3½	<i>a</i> 2H — <i>p</i> 2G° (99)
*2482. 711	A	(15h)	1. 37	6. 34	4½—4½	<i>a</i> 2G — <i>n</i> 4F° (88)	2564. 228 *2564. 817	A A	(20h) (40r?)	1. 88 1. 86	6. 70 6. 68	5½—5½ 4½—4½	<i>a</i> 2H — <i>r</i> 2H° (100)
2388. 910 2386. 956 2398. 877 2377. 083	A A A A	40 40 4 3	1. 37 1. 34 1. 37 1. 34	6. 54 6. 51 6. 51 6. 54	4½—4½ 3½—3½ 4½—3½ 3½—4½	<i>a</i> 2G — <i>p</i> 2G° (89)	2934. 72 2930. 89 2927. 646 2924. 92 2922. 715 2921. 18 2949. 91 m2943. 88 2938. 30 2933. 234	G G D G H G G P F H	20h 15h 10h 5h 5h 6h 2h V I 5h 3h	2. 12 2. 09 2. 07 2. 05 2. 03 2. 02 2. 12 2. 09 2. 07 2. 05	6. 32 6. 30 6. 28 6. 26 6. 25 6. 24 6. 30 6. 28 6. 26 6. 25	6½—6½ 5½—5½ 4½—4½ 3½—3½ 2½—2½ 1½—1½ 6½—5½? 5½—4½ 4½—3½ 3½—2½	<i>z</i> 6G°— <i>h</i> 6G† (101)
2852. 899	D	25	1. 70	6. 03	1½—½	<i>a</i> 2P — <i>v</i> 2S°† (91)							
2785. 66 2783. 76	G G	10 7	1. 70 1. 70	6. 13 6. 14	1½—2½ ½—1½	<i>a</i> 2P — <i>t</i> 2D° (92)							

Strongest Unclassified Lines of V I

2846. 600 2755. 653 2731. 518 2656. 55 *2637. 222§	D A A A A	20 (10) (20h?) 10 (20H)	IV V IV III III				2511. 182 2498. 024 2475. 178 2465. 664 2216. 666	A A A A A	20h (10h) 10 10h 10	III			
2607. 752 2568. 376 2533. 800 2520. 31 2514. 322	A A A A A	(10) 30h 10h 10h 15h	III				2089. 94 2079. 56 2072. 75 2043. 13 2041. 74	H H H H H	(20) (15dr?) (10) (20) (10N)				

V II

I P 14.1 Anal A List B Oct. 1948

REFERENCE

A W. F. Meggers and C. E. Moore, J. Research Nat. Bur. Std. **25**, 83, RP1317 (1940). W L, I, T
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V II

V II

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air							Air						
2700.944	A	300r	0.04	4.61	4-5	$a^5D - z^5P^o$	2140.064	A	150	0.04	5.81	4-3	$a^5D - z^5P^o$
2706.17	A	200rs	0.03	4.59	3-4	(1)	2141.973	A	100	0.03	5.79	3-2	(7)
*2715.676	A	180rs	0.01	4.56	2-3		2143.038	A	60	0.01	5.77	2-1	
2728.644	A	150	0.00	4.53	1-2		2134.12	A	200	0.03	5.81	3-3	
2739.715	A	100	0.00	4.50	0-1		2137.31	A	100	0.01	5.79	2-2	
*2715.676	A	180rs	0.04	4.59	4-4		2139.798	A	100	0.00	5.77	1-1	
2723.218	A	20	0.03	4.56	3-3		2129.477	A	40	0.01	5.81	2-3	
2733.906	A	25	0.01	4.53	2-2		m2134.07	P	V II	0.00	5.79	1-2	
2742.43	A	25	0.00	4.50	1-1		2138.17	A	60	0.00	5.77	0-1	
2732.92	A	5	0.04	4.56	4-3								
2741.563	A	4	0.03	4.53	3-2		2123.340	A	60	0.04	5.85	4-4	$a^5D - y^5D^o$
							2128.241	A	7	0.03	5.82	3-3	(8)
2711.740	A	100	0.04	4.59	4-3	$a^5D - z^5D^o$	m2134.16	P	V III	0.04	5.82	4-3	
2714.205	A	50	0.03	4.57	3-2	(2)	2131.85	A	80	0.03	5.81	3-2	
2713.050	A	40	0.01	4.56	2-1		2126.932	A	20	0.01	5.82	2-1	
2702.185	A	200r	0.03	4.59	3-3		2127.34	A	5	0.00	5.81	1-0	
2706.70	A	150r	0.01	4.57	2-2		*2117.482§	A	12	0.03	5.85	3-4	
2707.86	A	100	0.00	4.56	1-1		2123.62	A	10	0.01	5.82	2-3	
2694.74	A	20H	0.01	4.59	2-3		2124.00	A	5d?	0.00	5.81	1-2	
2701.535	A	10	0.00	4.57	1-2		2122.11	A	1	0.00	5.82	0-1	
2705.220	A	40	0.00	4.56	0-1								
							Vac						
2687.960	A	300r	0.04	4.63	4-4	$a^5D - z^5D^o$	1920.36	A	12	0.01	6.44	2-1?	$a^5D - z^5S^o$
2679.327	A	200r	0.03	4.63	3-3	(3)							(9)
2682.875	A	100	0.01	4.61	2-2								
2685.689	A	30	0.00	4.60	1-1		Air						
2688.717	A	100	0.04	4.63	4-3		2924.017	A	300R	0.39	4.61	5-5	$a^5F - z^5F^o$
2690.252	A	150	0.03	4.61	3-2		2924.633	A	250R	0.37	4.59	4-4	(10)
2690.792	A	200	0.01	4.60	2-1		2930.798	A	150r	0.35	4.56	3-3	
2689.883	A	100	0.00	4.59	1-0		2941.485	A	100	0.33	4.53	2-2	
2678.572	A	100r	0.03	4.63	3-4		2950.344	A	80	0.32	4.50	1-1	
2672.005	A	15Cr	0.01	4.63	2-3		2941.372	A	200	0.39	4.59	5-4	
2677.804	A	150r	0.00	4.61	1-2		2944.568	A	250r	0.37	4.56	4-3	
2683.09	A	100	0.00	4.60	0-1		2952.07	A	150r	0.35	4.53	3-2	
							2957.520	A	100	0.33	4.50	2-1	
							2907.457	A	120	0.37	4.61	4-5	
2545.460	A	15	0.04	4.89	4-5	$a^5D - z^5G^o \dagger$	2911.050	A	160r	0.35	4.59	3-4	
						(4)	*2920.377	A	100	0.33	4.56	2-3	
2493.576	A	15	0.04	4.99	4-4	$a^5D - z^5F^o \dagger$	2934.394	A	60	0.32	4.53	1-2	
2500.076	A	4	0.03	4.96	3-3	(5)							
							2919.989	A	50	0.37	4.59	4-3	$a^5F - z^5D^o$
2148.42	A	40	0.03	5.77	3-2	$a^5D - z^5P^o$	*2920.377	A	100	0.35	4.57	3-2	(11)
2145.990	A	40	0.01	5.76	2-1	(6)	2917.365	A	50	0.33	4.56	2-1	
2147.52	A	20	0.00	5.75	1-0		2906.448	A	150r	0.35	4.59	3-3	
2143.706	A	5	0.01	5.77	2-2		2910.007	A	140r	0.33	4.57	2-2	
2142.74	A	4	0.00	5.76	1-1		*2910.380§	A	150r	0.32	4.56	1-1	
							2896.198	A	100	0.33	4.59	2-3	
							2903.068	A	100	0.32	4.57	1-2	

V II—Continued

V II—Continued

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air							Vac						
2908. 810	A	300R	0. 39	4. 63	5-4	$a^5F - z^5D^\circ$	1587. 40	A	50	0. 39	8. 17	5-4	$a^5F - x^5D^\circ$
2893. 314	A	250r	0. 37	4. 63	4-3	(12)	1586. 58	A	40	0. 37	8. 15	4-3	(19)
2892. 650	A	200r	0. 35	4. 61	3-2		1585. 361	A	30	0. 35	8. 13	3-2	
2891. 636	A	150r	0. 33	4. 60	2-1		1584. 06	A	15	0. 33	8. 13	2-1	
2889. 614	A	100	0. 32	4. 59	1-0		1582. 80	A	8	0. 32	8. 12	1-0	
2892. 434	A	150r	0. 37	4. 63	4-4		*1582. 57	A	15	0. 37	8. 17	4-4	
2880. 026	A	150	0. 35	4. 63	3-3					0. 35	8. 15	3-3	
2882. 493	A	120	0. 33	4. 61	2-2		1582. 32	A	8	0. 33	8. 13	2-2	
*2884. 776	A	150	0. 32	4. 60	1-1		1581. 99	A	8	0. 32	8. 13	1-1	
2879. 158	A	40	0. 35	4. 63	3-4								
2869. 957	A	10	0. 33	4. 63	2-3		1547. 20	A	15	0. 39	8. 37	5-6?	$a^5F - y^5G^\circ$
2875. 687	A	30	0. 32	4. 61	1-2		1553. 09	A	15	0. 37	8. 32	4-5?	(20)
							1558. 76	A	15	0. 35	8. 27	3-4?	
2742. 670	A	30	0. 39	4. 89	5-5	$a^5F - z^5G^\circ$	1562. 98	A	10	0. 33	8. 23	2-3?	
2743. 768	A	20	0. 37	4. 86	4-4	(13)	1571. 74	A	2	0. 32	8. 18	1-2?	
2744. 54	A	4	0. 35	4. 84	3-3		1565. 98	A	8	0. 35	8. 23	3-3?	
*2758. 53	A	9H1	0. 39	4. 86	5-4		1573. 78	A	0	0. 33	8. 18	2-2?	
2682. 535	A	6	0. 39	4. 99	5-4	$a^5F - z^5F^\circ$							
*2685. 41	A	1?	0. 37	4. 96	4-3	(14)							
2668. 595	A	4	0. 37	4. 99	4-4								
2673. 955	A	4	0. 35	4. 96	3-3		Air						
m2657. 26	P	V II	0. 35	4. 99	3-4		2514. 633	A	200	1. 12	6. 03	4-5	$a^3F - y^5G^\circ$
2665. 277	A	3	0. 33	4. 96	2-3		2506. 215	A	200	1. 09	6. 02	3-4	(21)
							2503. 018	A	180	1. 07	6. 00	2-3	
2275. 586	A	7	0. 35	5. 77	3-2	$a^5F - z^5P^\circ$	2522. 392	A	6	1. 12	6. 02	4-4	
2271. 848	A	10	0. 33	5. 76	2-1	(15)	2515. 722	A	9	1. 09	6. 00	3-3	
*2273. 024	A	40h	0. 32	5. 75	1-0								
2269. 293	A	3	0. 33	5. 77	2-2		2488. 616	A	6	1. 12	6. 08	4-4	$a^3F - y^5F^\circ$
2267. 612	A	5	0. 32	5. 76	1-1		2646. 65	A	1	1. 07	6. 07	2-2	(22)
							2476. 963	A	1	1. 09	6. 07	3-2	
*2258. 814§	A	50	0. 39	5. 85	5-4	$a^5F - y^5D^\circ$	2472. 870	A	5	1. 09	6. 08	3-4	
2261. 084	A	30	0. 37	5. 82	4-3	(16)	2464. 094	A	15	1. 07	6. 08	2-3	
*2256. 984§	A	20	0. 35	5. 81	3-2								
2250. 490	A	5	0. 33	5. 82	2-1		2468. 654	A	8	1. 12	6. 12	4-5	$a^3F - z^5H^\circ$
2250. 382	A	3	0. 32	5. 81	1-0								(23)
2248. 913	A	4	0. 37	5. 85	4-4								
2252. 953	A	7	0. 35	5. 82	3-3		2434. 94	A	5?	1. 09	6. 16	3-2	$a^3F - z^5D^\circ$
2250. 800	A	5	0. 33	5. 81	2-2		2423. 030	A	6	1. 07	6. 16	2-2	(24)
2246. 332	A	3	0. 32	5. 82	1-1								
*2246. 65	A	1?	0. 32	5. 81	1-2		2380. 910	A	120	1. 12	6. 31	4-3	$a^3F - y^5D^\circ$
							2383. 995	A	80	1. 09	6. 27	3-2	(25)
Vac							2389. 696	A	100	1. 07	6. 23	2-1	
1677. 88	A	3	0. 39	7. 75	5-4	$a^5F - 1^\circ$	2366. 490	A	25	1. 09	6. 31	3-3	
1672. 44	A	15	0. 37	7. 75	4-4	(17)	2372. 584	A	20	1. 07	6. 27	2-2	
							2355. 232	A	4	1. 07	6. 31	2-3	
1636. 02	A	40	0. 39	7. 94	5-5	$a^5F - y^5F^\circ$							
1637. 77	A	50	0. 37	7. 90	4-4	(18)	2294. 992	A	40	1. 12	6. 50	4-4	$a^3F - x^5F^\circ$
1639. 13	A	40	0. 35	7. 88	3-3		2295. 504	A	20	1. 09	6. 47	3-3	(26)
1640. 15	A	35	0. 33	7. 86	2-2		*2292. 588	A	30	1. 07	6. 45	2-2	
1640. 86	A	30	0. 32	7. 85	1-1		2309. 072	A	10	1. 12	6. 47	4-3	
*1643. 02	A	30	0. 39	7. 90	5-4		2303. 238	A	10	1. 09	6. 45	3-2	
			0. 37	7. 88	4-3		*2281. 601	A	60	1. 09	6. 50	3-4	
*1643. 43	A	30	0. 35	7. 86	3-2		2284. 920	A	15	1. 07	6. 47	2-3	
*1643. 02	A	30	0. 33	7. 85	2-1								
1630. 82	A	20	0. 37	7. 94	4-5		2289. 219	A	70	1. 12	6. 51	4-3	$a^3F - x^5D^\circ$
1633. 51	A	25	0. 35	7. 90	3-4		2279. 376	A	15	1. 09	6. 51	3-2	(27)
1635. 86	A	20	0. 33	7. 88	2-3		2273. 89	A	2	1. 07	6. 49	2-1	
1637. 93	A	10	0. 32	7. 86	1-2		2275. 883	A	7	1. 09	6. 51	3-3	

V II—Continued

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air						
2229.985	A	80	1.12	6.66	4-3	$a^3F - w^3D^o$
2220.214	A	100	1.09	6.65	3-2	(28)
m2216.05	P	V III	1.07	6.64	2-1	
*2217.32	A	8	1.09	6.66	3-3	
2210.305	A	8	1.07	6.65	2-2	
2168.08	A	10	1.12	6.82	4-5	$a^3F - x^3G^o$
						(29)
Vac						
1883.98	A	20	1.12	7.68	4-4	$a^3F - w^3F^o\uparrow$
1876.47	A	10	1.09	7.67	3-3	(30)
1871.08	A	12	1.07	7.66	2-2	
1813.87	A	8	1.12	7.93	4-5	$a^3F - w^3G^o\uparrow$
						(31)
1748.99	A	5	1.07	8.13	2-1	$a^3F - x^3D^o$
						(32)
1693.49	A	12	1.12	8.41	4-4	$a^3F - v^3F^o\uparrow$
1693.09	A	10	1.09	8.38	3-3	(33)
1692.11	A	10	1.07	8.36	2-2	
1670.90	A	5	1.12	8.51	4-3	$a^3F - u^3D^o\uparrow$
1667.88	A	5	1.09	8.49	3-2	(34)
1663.34	A	3	1.07	8.49	2-1	
Air						
2870.111	A	9	1.47	5.77	2-2	$a^3P - z^3P^o$
2842.043	A	2	1.42	5.76	1-1	(35)
2874.205	A	5	1.47	5.76	2-1	
2850.477	A	1	1.42	5.75	1-0	
2838.053	A	10	1.42	5.77	1-2	
2824.444	A	4	1.39	5.76	0-1	
*2809.184	A	1	1.42	5.81	1-2	$a^3P - y^3D^o$
2791.50	A	7	1.39	5.82	0-1	(36)
2840.593	A	6	1.47	5.81	2-2	
2808.701	A	4	1.42	5.82	1-1	
2804.10	A	10	1.47	5.82	2-1	
2815.032	A	5	1.42	5.81	1-0	
2551.724	A	15	1.47	6.31	2-3	$a^3P - y^3D^o$
2546.311	A	5	1.42	6.27	1-2	(37)
2572.096	A	2	1.47	6.27	2-2	
2566.033	A	7	1.42	6.23	1-1	
2592.215	A	4	1.47	6.23	2-1	
2549.272	A	120	1.47	6.31	2-2	$a^3P - y^3P^o$
2548.685	A	60	1.42	6.26	1-1	(38)
2574.520	A	60	1.47	6.26	2-1	
2553.668	A	40	1.42	6.25	1-0	
*2523.953	A	100	1.42	6.31	1-2	
2534.519	A	80	1.39	6.26	0-1	
2482.307	A	150	1.47	6.44	2-1	$a^3P - z^3S^o$
2458.288	A	50	1.42	6.44	1-1	(39)
2445.107	A	6	1.39	6.44	0-1	
2469.388	A	5	1.47	6.47	2-3	$a^3P - x^3F^o$
2478.340	A	1	1.47	6.45	2-2	(40)

V II—Continued

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air						
2446.697	A	30	1.47	6.51	2-3	$a^3P - x^3D^o$
2427.316	A	20	1.42	6.51	1-2	(41)
m2420.07	P	V I	1.39	6.49	0-1	
2450.734	A	20	1.47	6.51	2-2	
2432.976	A	20	1.42	6.49	1-1	
2456.508	A	3	1.47	6.49	2-1	
2408.430	A	15	1.39	6.52	0-1	$a^3P - z^3P^o$
						(42)
2379.149	A	100	1.47	6.66	2-3	$a^3P - w^3D^o$
2360.334	A	50	1.42	6.65	1-2	(43)
2354.656	A	20	1.39	6.64	0-1	
m2382.48	P	V III	1.47	6.65	2-2	
2366.883	A	20	1.42	6.64	1-1	
2389.144	A	2	1.47	6.64	2-1	
2335.326	A	10	1.47	6.75	2-2	$a^3P - x^3P^o$
2313.939	A	9	1.42	6.75	1-1	(44)
2335.204	A	2	1.47	6.75	2-1	
2308.831	A	5	1.42	6.77	1-0	
2314.055	A	3	1.42	6.75	1-2	
2302.256	A	5	1.39	6.75	0-1	
2248.748	A	10	1.47	6.87	2-1	$a^3P - y^3S^o$
						(45)
*2765.676	A	150+H1	1.57	6.03	6-5	$a^3H - y^3G^o$
2768.566	A	100	1.56	6.02	5-4	(46)
2774.28	A	100	1.55	6.00	4-3	
2759.22	A	1	1.56	6.03	5-5	
2762.714	A	3	1.55	6.02	4-4	
2727.929	A	6	1.56	6.08	5-4	$a^3H - y^3F^o$
2726.544	A	40	1.55	6.08	4-3	(47)
2722.258	A	3	1.55	6.08	4-4	
2710.17	A	15	1.57	6.12	6-5	$a^3H - z^3H^o$
						(48)
2694.47	A	5	1.56	6.14	5-4	$a^3H - z^3G^o$
						(49)
2527.903	A	250	1.57	6.45	6-6	$a^3H - y^3H^o$
2528.833	A	220	1.56	6.44	5-5	(50)
2528.466	A	200	1.55	6.43	4-4	
2534.263	A	9	1.57	6.44	6-5	
2533.365	A	15	1.56	6.43	5-4	
2522.513	A	20	1.56	6.45	5-6	
*2523.953	A	100	1.55	6.44	4-5	
2497.002	A	4	1.56	6.50	5-4	$a^3H - x^3F^o$
2508.854	A	4	1.55	6.47	4-3	(51)
2461.495	A	40	1.57	6.58	6-7	$a^3H - z^3I^o$
2471.119	A	25	1.56	6.55	5-6	(52)
2478.621	A	20	1.55	6.53	4-5	
2476.295	A	5h	1.57	6.55	6-6	
2407.592	A	5	1.56	6.68	5-4	$a^3H - y^3G^o$
						(53)

V II—Continued

V II—Continued

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air							Air						
2346. 868	A	25	1. 55	6. 81	4-3	$a^3H - y^1F^\circ$ (54)	2542. 935	A	15	1. 67	6. 52	2-1	$b^3F - z^1P^\circ$ (70)
2352. 177	A	100	1. 57	6. 82	6-5	$a^3H - x^3G^\circ$ (55)	2479. 518	A	180	1. 68	6. 66	4-3	$b^3F - w^3D^\circ$ (71)
2342. 142	A	60+h	1. 56	6. 83	5-4		2479. 043	A	200	1. 67	6. 65	3-2	
2335. 480	A	40	1. 55	6. 83	4-3		2483. 064	A	120	1. 67	6. 64	2-1	
2347. 507	A	8	1. 56	6. 82	5-5		2475. 451	A	20	1. 67	6. 66	3-3	
2337. 956	A	4	1. 55	6. 83	4-4		2475. 865	A	30	1. 67	6. 65	2-2	
2341. 358	A	4	1. 57	6. 84	6-6	$a^3H - z^1I^\circ$ (56)	2406. 989	A	5	1. 68	6. 81	4-3	$b^3F - y^1F^\circ$ (72)
							2400. 166	A	4	1. 67	6. 81	2-3	
2336. 098	A	30	1. 57	6. 85	6-5	$a^3H - y^1H^\circ$ (57)	2403. 240	A	9	1. 68	6. 82	4-5	$b^3F - x^3G^\circ$ (73)
							2393. 814	A	8	1. 67	6. 83	3-4	
Vac							2388. 260	A	5	1. 67	6. 83	2-3	
1938. 70	A	8	1. 57	7. 94	6-5	$a^3H - y^5F^\circ$ (58)	2397. 622	A	6	1. 68	6. 83	4-4	
*1945. 35§§	A	30	1. 56	7. 90	5-4		2391. 226	A	10h	1. 67	6. 83	3-3	
1940. 86	A	40	1. 57	7. 93	6-5	$a^3H - w^3G^\circ$ (59)	2058. 34	A	40	1. 68	7. 68	4-4	$b^3F - w^3F^\circ$ (74)
1941. 40	A	30	1. 56	7. 92	5-4		2057. 36	A	25	1. 67	7. 67	3-3	
1941. 27	A	30	1. 55	7. 91	4-3		2057. 20	A	15	1. 67	7. 66	2-2	
1937. 68	A	7	1. 56	7. 93	5-5		2055. 55	A	8	1. 67	7. 68	3-4	
1938. 50	A	10	1. 55	7. 92	4-4		2055. 15	A	5	1. 67	7. 67	2-3	
							Vac						
Air							1833. 58	A	10	1. 68	8. 41	4-4	$b^3F - v^3F^\circ$ (75)
2967. 545		5	1. 68	5. 84	4-5	$b^3F - z^3H^\circ$ (60)	1839. 54	A	20	1. 67	8. 38	3-3	
*2983. 009	A	10	1. 67	5. 81	3-4		1843. 43	A	5	1. 67	8. 36	2-2	
2836. 527	A	80	1. 68	6. 03	4-5	$b^3F - y^3G^\circ$ (61)	1807. 15	A	1	1. 68	8. 51	4-3	$b^3F - u^3D^\circ$ (76)
2841. 039	A	50	1. 67	6. 02	3-4		*1809. 81	A	8d?	1. 67	8. 49	3-2	
2849. 055	A	40	1. 67	6. 00	2-3		1809. 36	A	10e	1. 67	8. 49	2-1	
2803. 469		150	1. 68	6. 08	4-4	$b^3F - y^3F^\circ$ (62)							
2802. 796	A	100	1. 67	6. 08	3-3		Air						
2799. 451	A	100	1. 67	6. 07	2-2		2777. 748	A	80	1. 70	6. 14	3-2	$a^5P - z^5S^\circ$ (77)
2808. 023	A	4	1. 68	6. 08	4-3		2756. 460	A	60	1. 68	6. 14	2-2	
							2760. 122	A	40	1. 67	6. 14	1-2	
2780. 09		5+H	1. 68	6. 12	4-3	$b^3F - z^1F^\circ$ (63)	2544. 29	A	10H	1. 67	6. 52	1-1	$a^5P - z^1P^\circ$ (78)
2774. 976	A	30	1. 67	6. 12	3-3								
2770. 99	A	4	1. 67	6. 12	2-3		2039. 29	A	60	1. 70	7. 75	3-4	$a^5P - 1^\circ$ (79)
2768. 150	A	15	1. 68	6. 14	4-4	$b^3F - z^1G^\circ$ (64)							
*2758. 53	A	9Hl	1. 67	6. 14	2-2	$b^3F - z^5S^\circ$ (65)	Vac						
2745. 893	A	6	1. 67	6. 16	2-2	$b^3F - z^1D^\circ$ (66)	1907. 79	A	50	1. 70	8. 17	3-4	$a^5P - x^5D^\circ$ (80)
2667. 532	A	4	1. 68	6. 31	4-3	$b^3F - y^3D^\circ$ (67)	1908. 32	A	40h	1. 68	8. 15	2-3	
2703. 15	A	3	1. 67	6. 23	2-1		1909. 36	A	40	1. 67	8. 13	1-2	
*2560. 149	A	4	1. 68	6. 50	4-4	$b^3F - x^3F^\circ$ (68)	1913. 70	A	50	1. 70	8. 15	3-3	
2577. 682	A	4C	1. 68	6. 47	4-3		1912. 39	A	40	1. 68	8. 13	2-2	
2583. 007	A	20	1. 67	6. 45	3-2		1911. 88	A	40	1. 67	8. 13	1-1	
2552. 960	A	60	1. 68	6. 51	4-3	$b^3F - x^3D^\circ$ (69)	1917. 79	A	15	1. 70	8. 13	3-2	
2553. 028	A	40	1. 67	6. 51	3-2		1914. 91	A	15	1. 68	8. 13	2-1	
2555. 905	A	40	1. 67	6. 49	2-1		1913. 10	A	20	1. 67	8. 12	1-0	
m2548. 65	P	V II	1. 67	6. 51	3-3								
2549. 653	A	10	1. 67	6. 51	2-2		Air						
							2923. 340	A	20	1. 81	6. 03	5-5	$a^3G - y^3G^\circ$ (81)
							2925. 288	A	15	1. 80	6. 02	4-4	
							2930. 132	A	25	1. 79	6. 00	3-3	
							2933. 833	A	15	1. 81	6. 02	5-4	
							2938. 259	A	20	1. 80	6. 00	4-3	
							*2914. 87 §	A	10	1. 80	6. 03	4-5	
							2917. 230	A	7	1. 79	6. 02	3-4	

V II—Continued

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air						
2888. 244	A	80	1. 81	6. 08	5-4	$a^3G - y^3F^\circ$
*2884. 776	A	150	1. 80	6. 08	4-3	(82)
2877. 689	A	60	1. 79	6. 07	3-2	
m2879. 97	P	V II	1. 80	6. 08	4-4	
2876. 939	A	9	1. 79	6. 08	3-3	
2855. 298	A	40	1. 80	6. 12	4-3	$a^3G - z^1F^\circ$
						(83)
2861. 401	A	5	1. 81	6. 12	5-5	$a^3G - z^1H^\circ$
						(84)
2850. 765	A	20	1. 81	6. 14	5-4	$a^3G - z^1G^\circ$
2842. 699	A	4	1. 80	6. 14	4-4	(85)
2821. 124	A	15	1. 79	6. 16	3-2	$a^3G - z^1D^\circ$
						(86)
2736. 69	A	10	1. 80	6. 31	4-3	$a^3G - y^3D^{\circ\ddagger}$
						(87)
*2658. 97	A	30	{1. 81	6. 45	5-6	$a^3G - y^3H^\circ$
			1. 80	6. 44	4-5	(88)
2657. 295	A	10	1. 79	6. 43	3-4	
2630. 665	A	150	1. 81	6. 50	5-4	$a^3G - x^3F^\circ$
2642. 212	A	80	1. 80	6. 47	4-3	(89)
2645. 840	A	80	1. 79	6. 45	3-2	
2623. 792	A	15+H	1. 80	6. 50	4-4	
2635. 640	A	10	1. 79	6. 47	3-3	
2616. 24	A	40	1. 80	6. 51	4-3	$a^3G - x^3D^\circ$
2614. 395	A	10	1. 79	6. 51	3-2	(90)
*2609. 80	A	5	1. 79	6. 51	3-3	
2463. 157	A	3	1. 80	6. 81	4-3	$a^3G - y^1F^\circ$
2457. 446	A	30	1. 79	6. 81	3-3	(91)
2465. 270	A	150	1. 81	6. 82	5-5	$a^3G - x^3G^\circ$
2453. 346	A	80	1. 80	6. 83	4-4	(92)
2444. 967	A	60	1. 79	6. 83	3-3	
2459. 358	A	15	1. 81	6. 83	5-4	
2450. 619	A	9	1. 80	6. 83	4-3	
2459. 233	A	5	1. 80	6. 82	4-5	
2447. 608	A	20	1. 81	6. 85	5-5	$a^3G - y^1H^\circ$
2441. 664	A	4h	1. 80	6. 85	4-5	(93)
2103. 70	A	80	1. 81	7. 68	5-4	$a^3G - w^3F^{\circ\ddagger}$
2101. 17	A	50	1. 80	7. 67	4-3	(94)
2099. 16	A	30	1. 79	7. 66	3-2	
*2014. 18	A	90	1. 81	7. 94	5-5	$a^3G - y^5F^\circ$
2025. 47	A	15	1. 79	7. 88	3-3	(95)
2024. 84	A	0??	1. 81	7. 90	5-4?	
2010. 15	A	5h	1. 80	7. 94	4-5	
*2016. 53	A	60	{1. 81	7. 93	5-5	$a^3G - w^3G^\circ$
			1. 80	7. 92	4-4	(96)
*2015. 74	A	20	1. 79	7. 91	3-3	
2020. 54	A	10	1. 81	7. 92	5-4	
2019. 47	A	10	1. 80	7. 91	4-3	
*2012. 64	A	10	1. 79	7. 92	3-4	

V II—Continued

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Vac						
*1869. 47	A	50	1. 81	8. 41	5-4	$a^3G - v^3F^\circ$
1874. 45	A	12	1. 80	8. 38	4-3	(97)
1877. 00	A	10	1. 79	8. 36	3-2	
1865. 99	A	3	1. 80	8. 41	4-4	
1799. 47	A	12	1. 81	8. 67	5-5	$a^3G - v^3G^{\circ\ddagger}$
1806. 49	A	8h	1. 80	8. 63	4-4	(98)
*1809. 81	A	8d?	1. 81	8. 63	5-4?	
1613. 20	A	15	1. 81	9. 46	5-4	$a^3G - u^3F^\circ$
1617. 35	A	10	1. 80	9. 43	4-3	(99)
1619. 18	A	10	1. 79	9. 41	3-2	
Air						
2798. 755	A	80	2. 04	6. 45	5-6	$b^3G - y^3H^\circ$
2797. 795	A	70	2. 03	6. 44	4-5	(100)
2797. 017	A	60	2. 02	6. 43	3-4	
2806. 544	A	4	2. 04	6. 44	5-5	
2581. 839	A	4	2. 03	6. 81	4-3	$b^3G - y^1F^\circ$
2576. 478	A	20	2. 02	6. 81	3-3	(101)
2584. 951	A	80	2. 04	6. 82	5-5	$b^3G - x^3G^{\circ\ddagger}$
2571. 059	A	50	2. 03	6. 83	4-4	(102)
2562. 760	A	30	2. 02	6. 83	3-3	
2578. 451	A	8	2. 04	6. 83	5-4	
2568. 065	A	3	2. 03	6. 83	4-3	
2565. 543	A	15	2. 04	6. 85	5-5	$b^3G - y^1H^\circ$
						(103)
2190. 22	A	30	2. 04	7. 68	5-4	$b^3G - w^3F^{\circ\ddagger}$
2186. 94	A	20	2. 03	7. 67	4-3	(104)
*2185. 39	A	50	2. 02	7. 66	3-2	
2095. 94	A	25	2. 04	7. 93	5-5	$b^3G - w^3G^{\circ\ddagger}$
2095. 37	A	15	2. 03	7. 92	4-4	(105)
2095. 05	A	15	2. 02	7. 91	3-3	
Vac						
1937. 44	A	60	2. 04	8. 41	5-4	$b^3G - v^3F^\circ$
1942. 35	A	40	2. 03	8. 38	4-3	(106)
1945. 64	A	30	2. 02	8. 36	3-2	
1933. 28	A	10	2. 03	8. 41	4-4	
1939. 32	A	8	2. 02	8. 38	3-3	
1903. 86	A	5?	2. 03	8. 51	4-3?	$b^3G - u^3D^\circ$
						(107)
1862. 37	A	30	2. 04	8. 67	5-5	$b^3G - v^3G^\circ$
*1869. 47	A	50	2. 03	8. 63	4-4	(108)
1876. 06	A	20	2. 02	8. 60	3-3	
1873. 39	A	10	2. 04	8. 63	5-4	
1878. 90	A	10	2. 03	8. 60	4-3	
1858. 50	A	2	2. 03	8. 67	4-5	
1866. 68	A	5	2. 02	8. 63	3-4	
1663. 60	A	15	2. 04	9. 46	5-4	$b^3G - u^3F^\circ$
1667. 66	A	10	2. 03	9. 43	4-3	(109)
1670. 01	A	10	2. 02	9. 41	3-2	
1660. 53	A	8	2. 03	9. 46	4-4	
1665. 42	A	8e	2. 02	9. 43	3-3	

V II—Continued

V II—Continued

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air *2685. 138§	A	20	2. 21	6. 81	4-3	$a^1G -y^1F^\circ$ (110)	Air 2007. 66	A	25	2. 27	8. 41	3-4	$a^3D -v^3F^\circ$
2680. 470	A	8	2. 21	6. 82	4-5	$a^1G -x^3G^\circ$	*2015. 02§	A	15	2. 26	8. 38	2-3	(126)
2670. 237	A	40	2. 21	6. 83	4-3	(111)	2020. 83	A	15	2. 26	8. 36	1-2	
2659. 60	A	25	2. 21	6. 85	4-5	$a^1G -y^1H^\circ$ (112)	2017. 46	A	2	2. 27	8. 38	3-3	
2155. 61	A	15	2. 21	7. 94	4-5	$a^1G -y^3F^\circ$ (113)	2021. 83	A	5	2. 26	8. 36	2-2	
2087. 92	A	20	2. 21	8. 12	4-4	$a^1G -x^1G^\circ$ (114)	Vac 1976. 62	A	60	2. 27	8. 51	3-3	$a^3D -u^3D^\circ$
2065. 76	A	40	2. 21	8. 19	4-3	$a^1G -x^1F^\circ$ (115)	1980. 04	A	40	2. 26	8. 49	2-2	(127)
Vac 1885. 90	A	10	2. 21	8. 76	4-5	$a^1G -x^1H^\circ$ (116)	1980. 59	A	25	2. 26	8. 49	1-1	
1838. 86	A	25	2. 21	8. 92	4-4	$a^1G -w^1G^\circ$ (117)	1982. 41	A	8	2. 27	8. 49	3-2	
							1981. 53	A	8	2. 26	8. 49	2-1	
							1739. 33	A	10l	2. 27	9. 36	3-3?	$a^3D -t^3D^\circ$ (128)
							1722. 62	A	10e	2. 27	9. 43	3-3	$a^3D -2^\circ$ (129)
							Air 2960. 777	A	6	2. 36	6. 53	4-5	$b^1G -z^3F^\circ$ (130)
*2914. 298§	A	40	2. 27	6. 50	3-4	$a^3D -x^3F^\circ$ (118)	2871. 543	A	3	2. 36	6. 66	4-3	$b^1G -w^3D^\circ$ (131)
2931. 859	A	10	2. 26	6. 47	2-3		2853. 761	A	4	2. 36	6. 68	4-4	$b^1G -y^1G^\circ$ (132)
2942. 37	A	15	2. 26	6. 45	1-2		2774. 718	A	60	2. 36	6. 81	4-3	$b^1G -y^1F^\circ$ (133)
2937. 030	A	15	2. 27	6. 47	3-3		2769. 731	A	20	2. 36	6. 82	4-5	$b^1G -x^3G^\circ$ (134)
m2944. 49	P	V II	2. 26	6. 45	2-2		2758. 810	A	15	2. 36	6. 83	4-3	
2904. 985	A	15	2. 27	6. 51	3-3	$a^3D -x^3D^\circ$ (119)	*2747. 462§	A	80	2. 36	6. 85	4-5	$b^1G -y^1H^\circ$ (135)
2905. 609	A	15	2. 26	6. 51	2-2		2141. 70	A	4h?	2. 36	8. 12	4-4	$b^1G -x^1G^\circ$ (136)
2911. 654	A	7	2. 26	6. 49	1-1		*2118. 43	A	30h	2. 36	8. 19	4-3	$b^1G -x^1F^\circ$ (137)
2913. 716	A	2	2. 26	6. 49	2-1		Vac 1978. 96	A	20	2. 36	8. 60	4-3	$b^1G -v^3G^\circ$ (138)
2899. 936	A	4	2. 26	6. 51	2-3		1929. 61	A	60	2. 36	8. 76	4-5	$b^1G -x^1H^\circ$ (139)
2903. 548	A	3	2. 26	6. 51	1-2		1880. 43	A	40e?	2. 36	8. 92	4-4	$b^1G -w^1G^\circ$ (140)
2810. 272	A	100	2. 27	6. 66	3-3	$a^3D -w^3D^\circ$ (120)	Air 2971. 998	A	4	2. 37	6. 52	1-1	$b^3P -z^1P^\circ$ (141)
2810. 158	A	60	2. 26	6. 65	2-2		2971. 571	A	8	2. 37	6. 52	0-1	
2817. 506	A	60	2. 26	6. 64	1-1		2873. 180	A	30	2. 36	6. 66	2-3	$b^3P -w^3D^\circ$
2814. 903	A	15	2. 27	6. 65	3-2		2880. 802	A	15	2. 37	6. 65	1-2	(142)
2819. 444	A	20	2. 26	6. 64	2-1		2890. 144	A	7	2. 37	6. 64	0-1	
2805. 544	A	30	2. 26	6. 66	2-3		2878. 028	A	7	2. 36	6. 65	2-2	
2808. 237	A	25	2. 26	6. 65	1-2		2890. 553	A	5	2. 37	6. 64	1-1	
2717. 464	A	5	2. 27	6. 81	3-3	$a^3D -y^1F^\circ$ (121)							
*2560. 149	A	4	2. 26	7. 08	2-2	$a^3D -y^1D^\circ$ (122)							
2281. 235	A	60	2. 27	7. 68	3-4	$a^3D -w^3F^\circ$ (123)							
2280. 338	A	60	2. 26	7. 67	2-3								
*2281. 601	A	60	2. 26	7. 66	1-2								
2283. 469	A	7	2. 27	7. 67	3-3								
2282. 863	A	6	2. 26	7. 66	2-2								
2161. 48	A	20	2. 27	7. 98	3-3	$a^3D -v^3D^\circ$ (124)							
2149. 386	A	8	2. 26	8. 00	2-2								
2142. 40	A	3	2. 26	8. 02	1-1								
2107. 40	A	10h	2. 27	8. 12	3-4	$a^3D -x^1G^\circ$ (125)							

V II—Continued

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air						
2809. 513	A	15	2. 36	6. 75	2-2	$b^3P-x^3P^0$
2811. 982	A	5	2. 37	6. 75	1-1	(143)
2804. 443	A	4	2. 37	6. 77	1-0	
2812. 164	A	6	2. 37	6. 75	1-2	
2811. 597	A	7	2. 37	6. 75	0-1	
2776. 24	A	6H	2. 36	6. 81	2-3	$b^3P-y^1F^0$
						(144)
2198. 524	A	20	2. 36	7. 98	2-3	$b^3P-v^3D^0$
2190. 48	A	8	2. 37	8. 00	1-2	(145)
2184. 17	A	5	2. 37	8. 02	0-1	
*2049. 67	A	5h	2. 36	8. 38	2-3?	$b^3P-v^3F^0$
						(146)
2006. 88	A	80	2. 36	8. 51	2-3	$b^3P-u^3D^0$
*2014. 18	A	90	2. 37	8. 49	1-2	(147)
2015. 56	A	20	2. 37	8. 49	0-1	
2012. 84	A	20	2. 36	8. 49	2-2	
*2015. 74	A	20	2. 37	8. 49	1-1	
2775. 770	A	70	2. 37	6. 82	6-5	$a^1I-x^3G^0$
						(148)
2760. 710	A	60	2. 37	6. 84	6-6	$a^1I-z^1I^0$
						(149)
2753. 407	A	150	2. 37	6. 85	6-5	$a^1I-y^1H^0$
						(150)
2871. 463	A	4	2. 46	6. 75	0-1	$a^1S-x^3P^0$
						(151)
2756. 38	A	4h	2. 46	6. 93	0-1	$a^1S-y^1P^0$
						(152)
2976. 72	P		2. 51	6. 66	2-3	$c^3P-w^3D^0$
2959. 55	A	1	2. 48	6. 65	1-2	(153)
2981. 924	A	15	2. 51	6. 65	2-2	
2969. 846	A	5	2. 48	6. 64	1-1	
2992. 378	A	2	2. 51	6. 64	2-1	
2908. 44	A	20	2. 51	6. 75	2-2	$c^3P-x^3P^0$
2886. 967	A	10	2. 48	6. 75	1-1	(154)
2879. 013	A	2	2. 48	6. 77	1-0	
2887. 158	A	8	2. 48	6. 75	1-2	
m2892. 57	P	V II	2. 49	6. 75	0-1	
2830. 402	A	40	2. 51	6. 87	2-1	$c^3P-y^3S^0$
m2810. 24	P	V II	2. 48	6. 87	1-1	(155)
2815. 547	A	3	2. 49	6. 87	0-1	
2101. 86	A	20	2. 51	8. 38	2-3	$c^3P-v^3F^0$
2098. 00	A	5d?	2. 48	8. 36	1-2?	(156)
2109. 27	A	8	2. 51	8. 36	2-2	
*2056. 89	A	15	2. 51	8. 51	2-3	$c^3P-u^3D^0$
2052. 38	A	10	2. 48	8. 49	1-2	(157)
*2056. 89	A	15	2. 49	8. 49	0-1	
2063. 12	A	20	2. 51	8. 49	2-2	

V II—Continued

I A	Ref	Int	E P		J	Multiplet (No)
			Low	High		
Air						
2864. 517	A	30	2. 50	6. 81	4-3	$b^3H-y^1F^0$
						(158)
2869. 131	A	150	2. 51	6. 82	6-5	$b^3H-x^3G^0$
2854. 335	A	120	2. 50	6. 83	5-4	(159)
2847. 573	A	100	2. 50	6. 83	4-3	
2862. 310	A	20	2. 50	6. 82	5-5	
2851. 260	A	15	2. 50	6. 83	4-4	
2845. 241	A	50	2. 51	6. 85	6-5	$b^3H-y^1H^0$
2838. 531	A	4	2. 50	6. 85	5-5	(160)
2835. 47	A	4	2. 50	6. 85	4-5	
2278. 972	A	40	2. 51	7. 93	6-5	$b^3H-w^3G^0$
2279. 762	A	20	2. 50	7. 92	5-4	(161)
*2281. 601	A	60	2. 50	7. 91	4-3	
2004. 77	A	90	2. 51	8. 67	6-5	$b^3H-v^3G^0$
*2014. 18	A	90	2. 50	8. 63	5-4	(162)
2023. 56	A	50	2. 50	8. 60	4-3	
2001. 43	A	10	2. 50	8. 67	5-5	
*2012. 64	A	10	2. 50	8. 63	4-4	
Vac						
1972. 62	A	20	2. 50	8. 76	4-5	$b^3H-x^1H^0$
						(163)
1921. 24	A	15he?	2. 50	8. 92	4-4	$b^3H-w^1G^0$
						(164)
*1780. 52	A	5h	2. 50	9. 43	4-3	b^3H-2^0
						(165)
Air						
2932. 323	A	60	2. 55	6. 75	3-2	$b^3D-x^3P^0$
2931. 624	A	20	2. 55	6. 75	2-1	(166)
2915. 330	A	30	2. 53	6. 77	1-0	
2895. 609	A	4	2. 55	6. 81	2-3	$b^3D-y^1F^0$
						(167)
2878. 299	A	3	2. 55	6. 83	2-3	$b^3D-x^3G^0$
						(168)
2852. 540	A	30	2. 55	6. 87	2-1	$b^3D-y^3S^0$
2844. 833	A	3	2. 53	6. 87	1-1	(169)
2273. 616	A	9	2. 55	7. 97	2-2	$b^3D-x^1D^0$
						(170)
*2273. 024	A	40h	2. 55	7. 98	3-3	$b^3D-v^3D^0$
2262. 404	A	9h	2. 55	8. 00	2-2	(171)
2251. 114	A	6	2. 53	8. 02	1-1	
2103. 53	A	30	2. 55	8. 41	3-4	$b^3D-v^3F^0$
2114. 03	A	30	2. 55	8. 38	2-3	(172)
2117. 293	A	25	2. 53	8. 36	1-2	
2114. 30	A	15	2. 55	8. 33	3-3	
2121. 54	A	10	2. 55	8. 36	2-2	
2068. 80	A	60	2. 55	8. 51	3-3	$b^3D-u^3D^0$
2074. 87	A	25	2. 55	8. 49	2-2	(173)
2072. 43	A	30	2. 53	8. 49	1-1	
2075. 13	A	15	2. 55	8. 49	3-2	
2076. 52	A	0??	2. 55	8. 49	2-1	
2068. 54	A	15	2. 55	8. 51	2-3	
2070. 79	A	15	2. 53	8. 49	1-2	

V II—Continued

V II—Continued

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac 1814. 93	A	5	2. 55	9. 35	2-1	$b^3D - t^3D^\circ \dagger$ (174)	Air 2566. 602	A	15	3. 31	8. 12	3-4	$a^1F - x^1G^\circ$ (193)
1785. 07	A	5	2. 55	9. 46	3-4	$b^3D - u^3F^\circ \dagger$	2090. 33	A	25	3. 31	9. 22	3-3	$a^1F - w^1F^\circ$
1793. 13	A	3	2. 55	9. 43	2-3	(175)	Vac 1924. 87	A	30	3. 31	9. 73	3-2	$a^1F - w^1D^\circ$ (195)
1792. 49	A	5	2. 55	9. 43	2-3	$b^3D - 2^\circ$ (176)	Air 2948. 076	A	60	3. 74	7. 93	4-5	$c^3F - w^3G^\circ$
Air 2926. 442	A	40	2. 59	6. 81	2-3	$a^1D - y^1F^\circ$ (177)	2955. 584	A	30	3. 74	7. 92	3-4	(196)
2840. 825	A	3	2. 59	6. 93	2-1	$a^1D - y^1P^\circ$ (178)	2958. 61	A	20	3. 74	7. 91	2-3	
*2292. 588	A	30	2. 59	7. 97	2-2	$a^1D - x^1D^\circ$ (179)	2956. 645	A	2	3. 74	7. 92	4-4	
2130. 42	A	5	2. 59	8. 38	2-3	$a^1D - v^3F^\circ$ (180)	2962. 014	A	5	3. 74	7. 91	3-3	
Vac							2915. 875	A	40	3. 74	7. 98	4-3	$c^3F - v^3D^\circ$
1862. 76	A	25	2. 59	9. 22	2-3	$a^1D - w^1F^\circ$ (181)	2897. 899	A	20	3. 74	8. 00	3-2	(197)
1729. 78	A	10e	2. 59	9. 73	2-2	$a^1D - w^1D^\circ$ (182)	2884. 064	A	6	3. 74	8. 02	2-1	
Air							*2750. 29	A	8H1	3. 74	8. 23	4-3?	$c^3F - y^5G^\circ$
2949. 172	A	40	2. 75	6. 93	1-1	$a^1P - y^1P^\circ$ (183)	*2782. 95	A	6H	3. 74	8. 18	3-2?	(198)
2850. 685	A	25	2. 75	7. 08	1-2	$a^1P - y^1D^\circ$ (184)	2642. 72	A	6	3. 74	8. 41	4-4	$c^3F - v^3F^\circ$
2362. 632	A	20	2. 75	7. 97	1-2	$a^1P - x^1D^\circ$ (185)	2668. 01	A	10H	3. 74	8. 36	2-2	(199)
2539. 20	A	20H1	2. 89	7. 75	5-4	$a^1H - 1^\circ$ (186)	2588. 128	A	3	3. 74	8. 51	4-3	$c^3F - u^3D^\circ$
2357. 810	A	60	2. 89	8. 12	5-4	$a^1H - x^1G^\circ$ (187)	*2597. 21	A	6h	3. 74	8. 49	3-2	(200)
*2044. 28§	A	5	2. 89	8. 92	5-4	$a^1H - w^1G^\circ$ (188)	2195. 69	A	15	3. 74	9. 36	4-3	$c^3F - t^3D^\circ \dagger$
2537. 619	A	20	3. 11	7. 97	2-2	$b^1D - x^1D^\circ$ (189)	2199. 443	A	10	3. 74	9. 35	3-2	(201)
2431. 59	A	4	3. 11	8. 19	2-3	$b^1D - x^1F^\circ$ (190)	2199. 660	A	7	3. 74	9. 35	2-1?	
*2782. 95	A	6H	3. 31	7. 75	3-4	$a^1F - 1^\circ$ (191)	2170. 05	A	10H	3. 74	9. 43	4-3	$c^3F - u^3F^\circ$
2648. 475	A	30	3. 31	7. 97	3-2	$a^1F - x^1D^\circ$ (192)	2167. 69	A	8	3. 74	9. 43	2-3	(202)
							2051. 79	A	30h	3. 74	9. 76	4-3	$c^3F - 3^\circ$
							2051. 27	A	5h	3. 74	9. 76	3-3	(203)
							*2049. 67	A	5h	3. 74	9. 76	2-3	
							m2941. 22	P	V II	3. 78	7. 98	4-3	$d^3F - v^3D^\circ$
							2926. 35	A	10h	3. 78	8. 00	3-2	(204)
							2918. 21	A	15h	3. 79	8. 02	2-1	
							2943. 631	A	3	3. 78	7. 98	3-3	
							2929. 017	A	4	3. 79	8. 00	2-2	
							*2844. 22	A	4H1	3. 78	8. 12	3-4	$d^3F - x^1G^\circ$ (205)
							*2750. 29	A	8H1	3. 78	8. 27	4-4?	$d^3F - y^5G^\circ \dagger$ (206)
							2663. 526	A	4h	3. 78	8. 41	4-4	$d^3F - v^3F^\circ \dagger$
							m2682. 81	P	V II	3. 78	8. 38	3-3	(207)
							2697. 201	A	10	3. 79	8. 36	2-2	
							2210. 029	A	10	3. 78	9. 36	4-3	$d^3F - t^3D^\circ$
							2215. 786	A	9h	3. 78	9. 35	3-2	(208)
							2219. 408	A	3	3. 79	9. 35	2-1?	
							2211. 38	A	2h?	3. 78	9. 36	3-3	
							*2217. 32	A	8	3. 79	9. 35	2-2	
							2171. 840	A	25	3. 78	9. 46	4-4	$d^3F - u^3F^\circ \dagger$
							*2185. 39	A	50	3. 78	9. 43	3-3	(209)
							2194. 84	A	8	3. 79	9. 41	2-2	

V II—Continued

V II—Continued

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Air 2185.96	A	40	3.79	9.43	2-3	$d^3F - 2^{\circ}$ (210)	Air *2795.39 2792.45 *2787.00	A A A	3H 6H1 10H	4.56 4.59 4.56	8.97 9.01 8.99	3-2? 4-4? 3-3?	$z^5F^{\circ} - e^5D$ (217)
2077.58	A	15H	3.79	9.73	2-2	$d^3F - w^1D^{\circ}$ (211)	*2765.676 2756.58 2749.48 2740.98 2736.12 2772.01 2767.10 2759.60 2749.97	A A A A A A A A A	150+H1 20H1 8H 7H1 4H 60H1 30H1 15H1 7H	4.61 4.59 4.56 4.53 4.50 4.61 4.59 4.56 4.53	9.07 9.06 9.05 9.03 9.02 9.06 9.05 9.03 9.02	5-6 4-5 3-4 2-3 1-2 5-5 4-4 3-3 2-2	$z^5F^{\circ} - e^5G$ (218)
2066.83	A	8h	3.79	9.76	2-3	$d^3F - 3^{\circ}$ (212)	2781.48 2771.41 *2787.00	A A A	100H 40H1 10H	4.61 4.59 4.61	9.05 9.04 9.04	5-5? 4-4 5-4	$z^5F^{\circ} - e^5F$ (219)
2663.25 2655.68 2649.37 2644.363 2640.86 2676.33 2666.79 2658.49 2651.57 2676.05	A A A A A A A A A A	250H 200H 150H 100H1 80H 7H 10H 7H1 5H 9H	4.38 4.34 4.31 4.29 4.27 4.38 4.34 4.31 4.29 4.34	9.01 8.99 8.97 8.96 8.94 8.99 8.97 8.96 8.94 8.96	6-7 5-6 4-5 3-4 2-3 6-6 5-5 4-4 3-3 5-4	$z^5G^{\circ} - e^5H$ (213)	2800.05 2818.52	A A	4H1 5H1	4.59 4.59	9.00 8.97	3-3 3-2	$z^3D^{\circ} - e^5P$ (220)
2636.00	A	5H	4.27	8.95	2-1?	$z^5G^{\circ} - e^5P$ (214)	2825.86 2843.82 *2844.22 2825.02 2831.60 *2835.35 2830.70	A A A A A A A	50H1 9H1 4H1 5H1 10H 6H 3H1	4.63 4.63 4.61 4.63 4.61 4.60 4.59	9.00 8.97 8.95 9.00 8.97 8.95 8.95	4-3 3-2 2-1 3-3 2-2 1-1 0-1	$z^5D^{\circ} - e^5P$ (221)
2616.66	A	10H	4.29	9.01	3-4?	$z^5G^{\circ} - e^5D$ (215)	2822.44 2834.55 2830.97 *2835.35	A A A A	80H1 30H1 3H1 6H	4.63 4.63 4.61 4.63	9.01 8.99 8.97 8.99	4-4? 3-3? 2-2? 4-3?	$z^5D^{\circ} - e^5D$ (222)
2629.72 2615.40 2608.00 2603.40 2601.08 2635.43 2624.860 2617.10 2611.51 *2609.80 2598.65 2594.43 m2593.05	A A A A A A A A A A A A A P	60H 40H 20H 15H 25H 7H 15H 9H 7H 5 2H 3h V III	4.38 4.34 4.31 4.29 4.27 4.38 4.34 4.31 4.29 4.34 4.31 4.29 4.27	9.07 9.06 9.05 9.03 9.02 9.06 9.05 9.03 9.02 9.07 9.06 9.05 9.03	6-6 5-5 4-4 3-3 2-2 6-5 5-4 4-3 3-2 5-6 4-5 3-4 2-3	$z^5G^{\circ} - e^5G$ (216)	2785.83 2795.72 2794.29 *2795.39 2800.95	A A A A A	5H 4H 5H 3H 20H1	4.63 4.63 4.61 4.63 4.63	9.06 9.05 9.03 9.05 9.04	4-5 3-4 2-3 4-5? 4-4	$z^5D^{\circ} - e^5G$ (223) $z^5D^{\circ} - e^5F$ (224)

Strongest Unclassified Lines of V II

2912.50	A	10H1				2612.26	A	15H			
2822.15	A	20H1				2611.24	A	10H			
2794.83	A	15H				2610.61	A	30H			
2791.63	A	10H				2602.94	A	15H			
2787.95	A	20h				2567.45	A	15H			
2784.25	A	60H				2554.22	A	15H			
2783.94	A	30H				2554.06	A	10H			
2778.60	A	80H				2542.46	A	20H1			
2755.05	A	10H1				2450.236	A	10h			
2752.11	A	15H1				2438.039	A	10h			
2751.79	A	10H1				2400.892	A	40h			
2734.27	A	15H1				2390.470	A	15h			
2732.17	A	10H1				2382.032	A	60+ Fe?			
2723.455	A	10				2372.168	A	15H			
2714.42	A	10H				2330.144	A	12			
2712.21	A	30H1				2283.766	A	40			
2696.51	A	20H				2261.850	A	10h			
2694.65	A	10H				2170.38	A	15			
2684.78	A	15H				2166.15	A	20h			
2673.25	A	50H				2164.38	A	15			
2661.47	A	30H				2163.68	A	20h			
2652.76	A	20H				2151.812	A	50			
2628.75	A	30H				2151.032	A	50			
2622.74	A	50H				2150.835	A	60			
2621.80	A	40H				2133.04	A	60			

Strongest Unclassified Lines of V II—Continued

I A	Ref	Int	I A	Ref	Int	I A	Ref	Int	I A	Ref	Int
Air			Air			Air			Vac		
2126. 585	A	25h	2061. 56	A	15	2022. 66	A	15h	1867. 47	A	20
2119. 562	A	15	2054. 85	A	70	2021. 38	A	10h	1828. 84	A	50
2119. 15	A	40h	2048. 75	A	15	2005. 88	A	15	1823. 61	A	25
2118. 84	A	25	2037. 83	A	50	2001. 65	A	40	1816. 30	A	20h
2111. 04	A	15	2037. 50	A	25	2001. 14	A	30	1796. 80	A	20
2087. 54	A	15	2035. 78	A	15	2000. 14	A	10h	1794. 62	A	50
						Vac					
2079. 29	A	10H	2035. 06	A	60	1992. 80	A	30	1788. 30	A	25
2077. 79	A	40H	2033. 50	A	10	1984. 05	A	90	1760. 11	A	25
2076. 87	A	60h	2031. 40	A	30h	1933. 97	A	30	1757. 76	A	20
2062. 00	A	10	2028. 88	A	15	1919. 35	A	20	1661. 27	A	60

V III

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REFERENCE

A H. E. White, Phys. Rev. 33, 672 (1929). W L, I, T

V III

V III

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
1159. 77	A	50	0. 07	10. 72	4½-5½	a 4F-z 4G°†	1331. 94	A	50	2. 10	11. 36	5½-4½	a 2H-z 2G°†
1163. 27	A	30	0. 04	10. 65	3½-4½	(1)	1335. 09	A	45	2. 08	11. 32	4½-3½	(9)
1166. 47	A	30	0. 02	10. 60	2½-3½								
1169. 28	A	20	0. 00	10. 56	1½-2½								
1166. 58	A	30	0. 07	10. 65	4½-4½								
							Air						
1149. 94	A	100	0. 07	10. 81	4½-4½	a 4F-z 4F°†	2371. 04	A	200	5. 51	10. 72	4½-5½	b 4F-z 4G°†
1151. 04	A	90	0. 04	10. 77	3½-3½	(2)	2382. 45	A	150	5. 47	10. 65	3½-4½	(10)
1152. 18	A	80	0. 02	10. 73	2½-2½		2393. 54	A	125	5. 45	10. 60	2½-3½	
1153. 19	A	70	0. 00	10. 71	1½-1½		2404. 16	A	100	5. 42	10. 56	1½-2½	
1154. 24	A	70	0. 07	10. 77	4½-3½		2399. 67	A	75	5. 51	10. 65	4½-4½	
							2407. 17	A	80	5. 47	10. 60	3½-3½	
							2413. 89	A	40	5. 45	10. 56	2½-2½	
1125. 71	A	30	0. 07	11. 04	4½-3½	a 4F-z 4D°†							
1122. 11	A	15	0. 04	11. 04	3½-2½	(3)	2330. 37	A	100	5. 51	10. 81	4½-4½	b 4F-z 4F°
1123. 00	A	15	0. 02	11. 01	2½-1½		2331. 67	A	75	5. 47	10. 77	3½-3½	(11)
1123. 55	A	15	0. 00	10. 99	1½-½		2334. 15	A	75	5. 45	10. 73	2½-2½	
							2337. 08	A	75	5. 42	10. 71	1½-1½	
							2348. 22	A	30	5. 51	10. 77	4½-3½	
							2347. 06	A	30	5. 47	10. 73	3½-2½	
1289. 42	A	30	1. 41	10. 98	1½-2½	a 2P-z 2D°†	2346. 28	A	30	5. 45	10. 71	2½-1½	
*1292. 77	A	20	1. 38	10. 93	½-1½	(4)	2314. 10	A	50	5. 47	10. 81	3½-4½	
							2318. 94	A	40	5. 45	10. 77	2½-3½	
							2325. 07	A	40	5. 42	10. 73	1½-2½	
1287. 88	A	20	1. 45	11. 04	2½-3½	a 4P-z 4D°†	2232. 76	A	70	5. 51	11. 04	4½-3½	b 4F-z 4D°†
1284. 23	A	15	1. 43	11. 04	1½-2½	(5)	2215. 86	A	40	5. 47	11. 04	3½-2½	(12)
							2217. 40	A	30	5. 45	11. 01	2½-1½	
							2218. 35	A	30	5. 42	10. 99	1½-½	
							2217. 80	A	25	5. 47	11. 04	3½-3½	
1313. 31	A	30	1. 50	10. 90	4½-3½	a 2G-z 2F°†	2204. 31	A	20	5. 45	11. 04	2½-2½	
1317. 25	A	20	1. 48	10. 85	3½-2½	(6)							
1252. 12	A	40	1. 50	11. 36	4½-4½	a 2G-z 2G°†							
1253. 99	A	30	1. 48	11. 32	3½-3½	(7)	2595. 11	A	170	6. 15	10. 90	3½-3½	b 2F-z 2F°†
							2593. 07	A	160	6. 09	10. 85	2½-2½	(13)
1389. 79	A	20	2. 02	10. 90	2½-3½	a 2D-z 2F°†	2554. 23	A	160	6. 15	10. 98	3½-2½	b 2F-z 2D°†
						(8)	2548. 22	A	150	6. 09	10. 93	2½-1½	(14)
							2366. 27	A	180	6. 15	11. 36	3½-4½	b 2F-z 2G°†
							2358. 70	A	180	6. 09	11. 32	2½-3½	(15)

V IV

I P 48 Anal C List C April 1949

REFERENCES

- A H. E. White, Phys. Rev. **33**, 538 (1929). W L, I, T
 B. Edlén, unpublished material (Feb. 1949). T

V IV

V IV

I A	Ref	Int	E P		J	Multiplet (No)	I A	Ref	Int	E P		J	Multiplet (No)
			Low	High						Low	High		
Vac							Vac						
*684.38	A	80	0.09	18.13	4-3	$a^3F - z^3D^\circ \dagger$	1939.07	A	100	11.95	18.32	3-4	$a^3D - z^3F^\circ \dagger$
684.44	A	50	0.04	18.08	3-2	(1)	1951.48	A	80	11.90	18.23	2-3	(6)
*684.38	A	80	0.00	18.04	2-1		1963.13	A	70	11.88	18.16	1-2	
677.35	A	50	0.09	18.32	4-4	$a^3F - z^3F^\circ \dagger$	1825.85	A	50	11.95	18.71	3-2	$a^3D - z^3P^\circ \dagger$
678.72	A	35	0.04	18.23	3-3	(2)	1817.72	A	30	11.90	18.69	2-1	(7)
679.65	A	25	0.00	18.16	2-2		1809.88	A	15	11.88	18.70	1-0	
750.10	A	30	1.44	17.90	2-2	$a^1D - z^1D^\circ$	Air						
						(3)	2268.30	A	100	12.46	17.90	2-2	$b^1D - z^1D^\circ$
737.84	A	100	2.36	19.09	4-3	$a^1G - z^1F^\circ$	Vac						
						(4)	1861.56	A	60	12.46	19.09	2-3	$b^1D - z^1F^\circ$
1997.74	A	80	11.95	18.13	3-3	$a^3D - z^3D^\circ$							
1999.32	A	60	11.90	18.08	2-2	(5)	1806.22	A	40	12.46	19.29	2-1	$b^1D - z^1P^\circ$
Air													(10)
2002.47	A	50	11.88	18.04	1-1								
2014.18	A	50	11.95	18.08	3-2								
2011.15	A	25	11.90	18.04	2-1								
Vac													
1982.49	A	30	11.90	18.13	2-3								
1990.75	A	30	11.88	18.08	1-2								

